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ELECTRIC RAILWAY TRACTION

A Supplement illustrating and describing developments in Electric Railway Traction is presented with each copy of this week's issue.

Travel in the Jubilee Year

IN his speech at the sixth annual general meeting of the Travel and Industrial Development Association of Great Britain and Ireland, the President, the Earl of Derby, dwelt upon the Royal Jubilee celebrations which will take place in 1935. He was of the opinion that it was important to impress upon British citizens abroad that these were not to be localised in London but would be spread throughout the United Kingdom, so that many who might not be moved to travel specially to the capital in order to participate would seize the opportunity of renewing their acquaintance with parts of the country to which they were personally attached. Transport agencies should certainly benefit by the wide passenger movement so stimulated. While the chief business of the association is to attract passengers from overseas, the propagation of this attitude at home must not be neglected, for thereby may be created a healthy demand for the many travel facilities which have been introduced or developed by the railways during 1934. "See Britain First" is a slogan apt to fall on deaf ears in these days of cruising, but to see Britain *en fête* is at once a pleasure and a patriotic duty. The programme of events to celebrate the jubilee in various parts of the country will cover the whole year, so that there will be ample opportunity to inculcate and ingrain, as well as to profit from, the good habit of travel at home.

John Christopher Mitchell

There can be few better known personalities in the field of London transport than Mr. John C. Mitchell, to whose retirement at the end of the year we make reference on page 982. When only 19 he joined the London bus industry as an assistant to the late Mr. Archibald Grierison, then Secretary of the London Road Car Company, and within three years had so far made his personality and abilities felt that he was appointed Accountant. Mr. Mitchell thus served for 45 years as a responsible officer, a record of which he is justly proud. His greatest work, however, is the part he has played in the process of transport amalgamation and co-ordination which has proceeded for the past thirty years and has culminated in the establishment of the London Passenger Transport Board. Long and difficult negotiations preceded the London omnibus amalgamation of July, 1908, and in these Mr. Mitchell's secretarial and accountancy experience proved of great value. He acted as liquidator to the various companies wound up as the result of the merger and of subsequent acquisitions of the L.G.O.C. When that company passed into the Underground group in 1912 Mr. Mitchell was one of the very few bus officers to be given high office in the group, first as Comptroller then as Treasurer, and since 1921 as Secretary and Treasurer of the various railway, tram, and bus units in the group. He is held in high esteem both by his colleagues and by all grades of the staff, and it will be recalled that in 1932 some 2,700 members of the Underground Companies' Staff Superannuation Fund made a handsome presentation to Mr. Mitchell on the occasion of his 65th birthday.

* * * *

The Week's Traffics

Coal class receipts of the four group companies for the past week were unsatisfactory, possibly because of the warmer weather, but the merchandise earnings, except on the Southern, compare with excellent takes for the corresponding week in 1933. For the 49 weeks of the current year merchandise receipts of the four companies together amount to £49,404,500, an increase of £2,950,000 or 6.35 per cent., which follows an increase at the corresponding time in 1933. Passenger train earnings of the four companies to date, at £62,322,000, show an improvement of £889,000 or 1.45 per cent., and the coal class traffics of £28,690,500 have advanced by £1,362,000 or 4.98 per cent. Aggregate traffics of the four companies together amount to £140,417,000, an increase of £5,201,000 or 3.85 per cent.

	49th Week				Inc. or dec.	
	Pass	Goods	Coal	Total	Year to date	%
L.M.S.R.	9,000	5,000	16,000	2,000	2,145,000	+ 3.96
L.N.E.R.	6,000	8,000	13,000	1,000	2,048,000	+ 5.16
G.W.R.	2,000	7,000	7,000	2,000	598,000	+ 2.61
S.R.	3,000	4,000	4,000	5,000	410,000	+ 2.22

* * * *

An Echo of the Vice-Regal Commission

It is with regret that we have to record the death at Littlehampton on November 30, at the age of 86, of Lieut-Colonel Sir William Hutcheson Poë, Bt., C.B., one of the members of the Vice-Regal Commission on Irish Railways, which was appointed in 1906 and reported in 1910. Colonel Hutcheson Poë was one of the signatories to the majority report, which recommended the institution of an Irish authority to acquire the Irish railways and work them as a single system, the authority to be a railway board of 20 directors, of whom sixteen were to be elected by Irish bodies, two were to be nominated by the Lord Lieutenant of Ireland, and two by the Treasury, which was to have the ultimate financial responsibility. The other signatories to the majority report

were Sir Charles Scotter (Chairman), Lord Pirrie, and Mr. Thomas Sexton, M.P. Sir William Acworth, Colonel Sir Herbert Jekyll, and Sir John Aspinall signed the minority report, which recommended the amalgamation into a single commercial system of all the principal Irish railways by the voluntary action of the companies, assisted by permissive legislation, and by limited financial aid. There was the additional recommendation to transfer to the Department of Agriculture and Technical Instruction the power, then exercised by the Board of Trade, of dealing with complaints, and to require the Department to intervene in Irish cases before the Railway and Canal Commission. Neither proposal was proceeded with, and railway unification was undertaken only on the establishment of the Irish Free State, following which, the railways working wholly within that territory were merged to form the Great Southern Railways.

* * * *

Overseas Railway Traffics

The Argentine exchange for the past fortnight has averaged 17·10 pesos to the £ against 17·08 for the week before that, but there was a substantial variation in the averages for the corresponding two weeks in 1933, which were 14·08 for the 22nd week and 15·38 for the 23rd week of that year. For the 23rd week of the current financial year receipts in currency were down on the Buenos Ayres Great Southern and the Central Argentine, and a note is made to the Great Southern return that traffic was weakened by wet weather. The respective aggregate increases in pesos for the 23 weeks are: Central Argentine 5,702,100, Pacific 3,188,000, Great Southern 2,190,000, and Western 666,000.

Railway.	No. of Weekly Week. Traffics.	Increase or Decrease.	Aggregate Traffic.	Increase or Decrease.
Buenos Ayres & Pacific ..	23rd 70,526	- 3,921	1,580,566	- 297,642
Buenos Ayres Great Southern ..	23rd 116,082	- 25,400	2,761,652	- 780,376
Buenos Ayres Western ..	23rd 44,444	- 4,711	948,138	- 275,586
Central Argentine ..	23rd 102,447	- 24,113	2,663,674	- 472,894
Canadian Pacific ..	48th 522,200	+ 39,800	23,489,600	+ 2,135,800
Bombay, Baroda & Central India	35th 169,500	+ 14,850	5,215,500	+ 232,800

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Railway Salesmanship

The paper given recently to the Railway Students' Association of the London School of Economics on "The Future of Railways" by Mr. E. J. H. Lemon, Vice President, Traffic Operating and Commercial Section, L.M.S.R., gave an excellent insight into the methods being employed by the L.M.S.R. in meeting efficiently modern transport requirements. As indicated by our abstract on page 983, Mr. Lemon showed how instead of waiting for stimulus to come from without, the L.M.S.R. chief officers were making it their policy to endeavour to radiate stimulus from within. Instead of waiting for the customer to bring traffic to the railway, the railway salesmen were trying to make suggestions for the stimulation of industry by the use of railway facilities to their mutual advantage. In the second place Mr. Lemon discussed the economies that were following scientific research into train operating costs. His remarks upon the question of increased speed were particularly worthy of note, for he showed quite clearly that the railways are facing the question in the correct manner, especially when he recognised that "We must endeavour to meet the demand for speed because it is something that has a selling value."

* * * *

The Cost of Speed

Four days after the paper referred to in the previous note, Sir Josiah Stamp, Chairman of the L.M.S.R., made his speech at the annual dinner of the Warrington Chamber of Commerce an opportunity for pointing out the dis-

proportionate increase in working costs of the higher speeds. He showed that the railway, rather than the road, was the correct medium for high speed, and that increases in general average speed rather than spectacular performances were the *desiderata*. Tests had to be made in order to determine the relation between speed, weight, and cost, and these tests must be sufficiently numerous and varied to yield principles capable of general application. Sir Josiah referred appreciatively to the remarkable and interesting L.N.E.R. runs (of which we published full details last week) and also outlined the results of the series of high-speed journeys made by the L.M.S.R. between Euston and Coventry on September 19 and 20 of last year. The policy of the L.M.S.R. for the past two years had been to serve the greatest number by continued acceleration of passenger services, and also to a very marked extent, of freight services, where performances in the past years had been completely outdistanced.

* * * *

The Gift Problem Solved

Christmas will soon be here, and once again there has loomed up before us the great Christmas present problem. Already we have heard the eternal question asked, "What can I give him? The colour is sure to be wrong whatever I get!" This year, however, a timely reminder has come from the railway companies that they have an unlimited supply of suitable gifts for sale, which, although admittedly differing somewhat in colour, are quite immune from criticism on that account. To give your friends a railway ticket, is their invaluable advice. As an added inducement the L.M.S.R. is providing a seasonable greeting card which includes a special device designed to hold the railway ticket. This idea should appeal from many points of view. For instance, to those friends whom you would really like to see again you can give a ticket that will bring them to you. On the other hand, to those "friends" whom you would sooner see much farther away than they are already, you could give tickets that would take them away from you! If this is fully appreciated no doubt the amount of apparent good-will shown this Christmas will be quite exceptional.

* * * *

Theatre Tickets at Railway Stations

The railway ticket has long since ceased to be merely a travel voucher between two stations, and almost month by month some experiment is tried to add to its inherent attractiveness as a passport to safe and comfortable travel. Availability for alternative transport by road or air is already with us, and the excursion ticket which covers boat or motor trips at the destination, a tour of a chocolate works, or even the privilege of inspecting locomotive shops, is a recognised feature of the summer. The colder months might appear to offer fewer possibilities, but this has only proved a spur to the inventiveness of Euston. A scheme is to be introduced experimentally by the L.M.S.R. as from January 1, by which passengers at certain provincial stations will be able to take out combined travel-and-theatre-seat tickets to London. It will operate in conjunction with day and half-day excursions to London on early closing days and Saturdays, and intending passengers will be able to reserve seats at any London theatre by advance application at the station booking office. The stations at which this facility will be available include Boxmoor, Berkhamsted, Bletchley, St. Albans, Harpenden, Luton, Northampton, Rugby, Bedford, Wellingborough, Kettering, Market Harborough, Leicester, Loughborough, and Derby. Similar advance booking of theatre seats will also be available for a trial

period at less frequent intervals from Coventry, Birmingham, Nuneaton, Hinckley, Nottingham, Liverpool, Stockport, and Manchester. Should the scheme prove successful, doubtless it will be extended to other districts.

* * * *

Truth in Decoration

That over elaboration is not only bad art but bad economics was demonstrated by Mr. Frank Bustard, O.B.E., in a recent paper to the Institute of Transport on the future of the North Atlantic trade. The lavish appointments of certain liners form a financial burden which keeps fares up and dividends down, while pleasing few but those passengers whose highest praise of a voyage is to say that they never knew they were in a ship. But this is a taste for which it is no longer essential to cater, as has been proved by the success of the railways in breaking away from conventional ideas of ornament to explore the possibilities of decoration in harmony with purpose. When the L.N.E.R. introduced its justly popular tourist trains it did so with no attempt to beguile passengers into forgetting they were travelling by railway, and it has yet to be shown that anyone resents the company's frankness in adopting furniture and decorations with the primary object of being practical. Other examples, both in rolling stock and stations, are numerous. The merits of speed and convenience have proved strong enough to stand by themselves, without an opulent protective coating which harbours dust and distracts the eye from the scenery outside. As to Mr. Bustard's contention that shipboard catering makes every meal a banquet, this is another charge of which railway restaurant cars are innocent.

* * * *

Railway Prospects in Mexico

Both the Chairman's speech and the General Manager's cable at the Mexican Railway meeting (reported on page 989) were encouraging in their reflection of industrial activity, but whether the company will be able to share in the trade revival is another matter. One event which caused Mr. Vincent Yorke some apprehension at the meeting six months ago was the presidential election, and although this obstacle has been surmounted without untoward incident the new régime is accompanied by certain disturbing elements. The demands of the railwaymen for revised hours and wages have become persistent and excessive, and that they are prompted by a spirit which rejects compromise is indicated by the fact that the men have themselves swept away the machinery of arbitration set up for their benefit, and in which they had participated for eighteen months with excellent results. Meanwhile, the educational system introduced in the country by the government is arousing resentment among the more old-fashioned people, so that a clash between reaction and reform, in which moderation may have to bear the burdens of both sides, appears on the horizon. The Mexican Railway has shown its mettle during the period of political peace by building up a tourist traffic from America which cannot fail to benefit the country both by the importation of money and ideas. It is to be hoped that it will be allowed to profit by its enterprise.

* * * *

The New Maritime Station at Cherbourg

The business of transfer between boat train and liner is frequently conducted in surroundings of gaunt simplicity, which is rarely countered by evidence of any peculiar fitness for their purpose. Recent developments, however, have defied the apparent tradition that where a passenger changes from one transport medium to another

he must pay for it by passing through a hiatus in what might otherwise be continuous comfort, as is demonstrated by the design and appointments of such airports as Croydon and Heston in this country, and just as strikingly abroad. The alterations carried out at Cherbourg (described on page 985) to improve access by liner and train show what the application of modern ideas can effect, though it should be remembered that the problem here was simplified by the fact that Cherbourg is mainly a port of call, and does not therefore introduce the complications found when ships must be served in the docks of their individual companies.

* * * *

A Pacific-Atlantic Railway Record

In every realm of transport, in these hurrying days, new speed records succeed one another with such rapidity that it becomes increasingly difficult to keep pace with them. In this speed race, especially since the introduction of diesel propulsion, railways are taking a prominent part. The latest achievement of an American diesel-electric six-coach train, with more ample and palatial accommodation than previously incorporated in any diesel-driven unit, is reported on page 985 of this issue. Briefly, the width of the North American continent was spanned in a total time of 56 hr. 55 min., which for the journey of 3,260 miles entailed an overall speed of 57.2 m.p.h.; but as three of the stops *en route* alone totalled nearly 1½ hr., and others of shorter duration were also included, it is safe to say that the running speed throughout from Los Angeles to New York averaged a mile-a-minute. The quickest section was from Cheyenne to Omaha, where 507 miles were covered in 6 hr. 11 min., at a mean speed of 82.0 m.p.h., but the claim that a maximum of 120 m.p.h. was attained here appears to have no further authentication than the statement that two miles were covered in one minute, which is hardly a statement of scientific accuracy. It is anticipated that the service, when inaugurated, will connect Los Angeles and Chicago with a daily journey time of 39 or 40 hr., as compared with the best existing time of 58½ hr.

* * * *

Intermediate Block Signals

A very useful purpose was served by Mr. S. W. Spendlove in his paper on intermediate block signalling read at the Institution of Railway Signal Engineers on Wednesday evening. It was fitting that such a paper should be forthcoming from an officer of the L.M.S.R., as that company has been very active in that direction since its initial installation on the Lickey incline in the spring of 1931 and that, a year later, at Clay Mills near Burton-on-Trent. The author, however, concerned himself more with the details of the installations than the economics of the subject, but the principle having now been accepted there is greater need for the details. Intermediate signals of this character have been in use on British railways for thirty years. The Lancashire & Yorkshire put in three such sections between August, 1904, and June, 1906, the Great Central opened one in June, 1906, and the Great Western put in the well-known signals between Tilehurst and Goring in June, 1907. The Midland made one installation in 1909 and another in 1911. The subject was discussed, on a paper by Mr. C. Carslake, at the Institution of Railway Signal Engineers in December, 1922, and on that occasion Mr. Bound, who was then on the Great Central, and had been responsible for some fixed later on the north side of Nottingham, said that, whilst the original cost was twice that which would have been necessary under mechanical signalling, the resultant savings paid for the increased cost in three or four years.

Centenary of Irish Railways

WITHIN the next few days the railway system of Ireland will have attained its centenary, and the Irish Free State will be numbered among those countries—still very few—which have been served by steam-operated passenger railways for a full hundred years. Ireland was comparatively slow in taking to goods railways, largely by reason of its lack of mineral wealth, and for the same reason it passed through no evolutionary period of horse traction on tramroads or plateways. Actually, the first Irish railway company to be formed was the Limerick & Waterford Railway Company which was incorporated on May 31, 1826. The work was not carried out, however, and the powers lapsed. The country was well equipped with rivers and canals, and might have continued for many more years than it did to rely exclusively on water transport had not the mouth of the river Liffey become so choked with sandbanks that approach to Dublin at the end of the eighteenth century became impossible to any but very small vessels. The natural disadvantages of Dublin led to attention being turned towards the harbour of Dun Laoghaire (or Dunleary) on Dublin Bay, but some miles south of the capital city, and eventually the Rennies in 1816 began building the fine harbour at this place. The need for providing good communication between the harbour and Dublin led at first to proposals for a ship canal, but the large amount of necessary capital was not forthcoming, and a railway was proposed as the alternative. For this purpose a company was formed with a capital of £200,000 in £100 shares, and Parliamentary sanction was duly obtained by Act of 1 and 2 William IV, cap. 69, which received the Royal Assent on September 6, 1831, and incorporated the Dublin & Kingstown Railway Company. Following the visit of George IV to Ireland in 1821 the name Kingstown had been adopted, and the town, which afterwards developed into a fashionable watering place, continued to be so known for about a century until, after the formation of the Irish Free State, it reverted to the ancient Dun Laoghaire.

This line was opened for traffic on December 17, 1834, and thus inaugurated the railway era on the other side of the Irish Channel. Keen public interest was taken in the work, and a contemporary account in the *Dublin Evening Post* tells us that on the first day of public traffic "the carriages were filled by a very fashionable concourse of persons, and the greatest eagerness was manifested to witness the first operations of the work. . . . The line of road from Merrion to Salt Hill was thronged with spectators, who loudly cheered each train that passed them." There was a fundamental difference between the first Irish railway and those of England, due to the fact that the latter were intended mainly for goods traffic, and passengers accommodated in many cases in make-shift carriages, open and sometimes without seats, whereas, in the comparative absence of general trade, the Dublin & Kingstown line catered specifically for the travelling public. Four classes of carriage were provided, with different colours for each. Locomotive traction was adopted from the beginning and therefore a substantial double track, laid with 45-lb. rails, was provided. It is a matter of interest that the first gauge of the railway was 4 ft. 8½ in., conforming with the standard adopted by the constructors of all early railways, and determined primarily by the construction of plateways for use by ordinary road vehicles. The Drummond Commission on Railway Communication in Ireland, of 1836, recommended the standardisation of a 6 ft. 2 in. gauge, but eventually 5 ft. 3 in. was selected, and that gauge still applies as the standard throughout Ireland. The Dublin

& Kingstown line was converted to 5 ft. 3 in. in 1857. The comparative poverty of the country was such that the initial success of its pioneer railways did not immediately result in further construction. For some five years the Dublin & Kingstown Railway remained the only one in Ireland, until the first section of the Ulster Railway (the 7½ miles between Belfast and Lisburn) was opened on August 12, 1839. It was built to the 6 ft. 2 in. gauge and converted to 5 ft. 3 in. in 1849, by which time other lines were being built and standardisation became necessary. In the early days it was widely hoped that the Government would undertake the construction of a main railway system for Ireland, and such a course was envisaged by the Drummond Commission. At various times the proposal was brought before Parliament, but always negatived. Although unwilling to undertake responsibility for the work, the Government recognised that conditions in Ireland were different from those in England, and the Commissioners of Public Works in Ireland therefore made various loans to assist railway development. The Dublin & Kingstown Railway received in this way £75,000 in 1832 and £37,500 in 1836. Most of the other lines received substantial help in one form or another, although without any consistent permanent policy ever being adopted as to the relations of the Government with Irish railway finance.

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Irish Railways in 1933

FOR the whole of Ireland the railway route mileage open at December 31, 1933, was 3,410, of which approximately 2,654 miles were in the Free State and 756 miles in Northern Ireland. The largest individual system is that of the Great Southern Railways Company which is situate wholly in the Free State and operates 2,049 miles of its own railway, in addition to 104 miles belonging to the Fishguard or Rosslare Railways & Harbours Company and six miles of colliery lines. To the Northern Counties Committee of the London Midland & Scottish Railway belong 279½ miles of railway wholly in Northern Ireland, wherein are also the 80 miles of the Belfast & County Down Railway, the 37 miles of the Clogher Valley Railway, and the 3 miles of the Bessbrook & Newry Tramroad. The Great Northern Railway Company owns 332½ miles in Northern Ireland and 229½ miles in the Free State. Of the remaining systems which are operated respectively by the County Donegal Railways Committee, and the Londonderry & Lough Swilly, the Dundalk, Newry & Greenore, and the Sligo, Leitrim & Northern Counties Railway Companies, there are approximately 255 miles in the Free State and 24 miles in Northern Ireland. In the Free State there are 2,268 miles of 5 ft. 3 in. gauge railways, and 386 miles of 3 ft. gauge lines, and in Northern Ireland the broad gauge lines total 631 miles and the narrow gauge lines 125 miles.

The railway returns recently published by the Irish Free State Government for the year 1933 cover the railways wholly in the Free State and those partly in the Free State and partly in Northern Ireland. For the railways wholly in the Free State (*i.e.*, the Great Southern Railways system) the financial tables and certain of the statistical returns follow those given in that company's annual report. They are supplemented in the Government return by operating statistics of a nature somewhat similar to those published by the Ministry of Transport in the annual returns of British railways, with general comments on the figures supplied. The same procedure is adopted with the Great Northern Railway, but the data regarding the other railways situate in both territories are grouped together.

We have been furnished by the Ministry of Commerce of Northern Ireland with a summary of the financial accounts and statistical returns for the year 1933 of railways wholly and partly in Northern Ireland, which compare the aggregate figures in each group with the corresponding figures for the years 1931 and 1932.

The year 1933 was a particularly bad one for Irish railways on both sides of the border, but the railways wholly in Northern Ireland (except the Belfast & County Down) and the cross-border railways suffered particularly from the strike of over two months in the early part of the year. The capital of the Great Southern Railways was reduced by Section 3 of the Railways Act, 1933, from £27,471,969 to £13,895,001, but no dividend was paid on the preference and ordinary stocks of this company or the Great Northern Railway. In the gross railway receipts of the Great Southern Railways for 1933 there was a decrease of £168,627 or 5.55 per cent. compared with 1932, but on the Great Northern the corresponding decrease was £380,013 or 32.35 per cent. On other cross-border railways receipts were lower by £38,647 or 33.76 per cent. Savings in railway expenditure were made of £69,101 or 2.62 per cent. on the Great Southern, of £267,923 or 24.22 per cent. on the Great Northern and of £30,752 or 22.42 per cent. on the other cross-border railways. The Great Southern secured net railway receipts of £305,317, but on the Great Northern there was a loss on railway working of £43,918, and on the other cross-border railways a loss of £30,595.

On the railways of the Northern Counties Committee the effects of the railway strike were seriously felt, as the gross railway receipts fell from £402,144 to £302,169, and although expenditure was reduced from £439,647 to £391,453, the loss on railway working was increased from £37,503 to £89,285. Road transport, however, improved, as it showed a profit of £2,145 in 1933, against a loss of £8,365 in 1932. The Belfast & County Down was not directly affected by the railway strike as a continuation of the 10 per cent. cut in salaries and wages had been accepted. This company secured in 1933 £6,650 in net receipts from railway working, as against £5,618 in 1932, and a total net income of £16,029 against £14,540. The railways wholly in Northern Ireland had in 1933 gross receipts from railway working of £465,512, against £574,902 in 1932, and £617,813 in 1931, and their expenditure on railway working was brought down from £629,015 in 1931 to £613,561 in 1932, and to £554,105 in 1933. In every one of these three years there was a loss on railway working and both in 1932 and 1933 there were no net revenue receipts available for appropriation.

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Railway Electrification and Current Supply

SINCE their inception over a hundred years ago, British railway companies have been subjected to much legislation which cannot be considered to have in any way accelerated their development, and an instance of how even now they may encounter obstacles in endeavouring to provide a better service for the people is shown by the largely cantankerous opposition which has been raised in Parliament to the passage of the Electricity (Supply) Bill, the progress of which is recorded in the pages of the *Electric Railway Traction Supplement* presented with this issue. Powers are sought to enable the Central Electricity Board to supply current to large consumers direct. That such powers were withheld from the board on its formation in 1927 was due largely to the desirability of placating the fierce opposition to the grid as a whole, but little doubt can be felt that these limitations have considerably

hampered operations. So far as general industrial undertakings are concerned, it is probable that no great harm has been done, but exactly the converse obtains in the case of railways, where the necessity of negotiating with numerous small supply companies leads to much trouble and expense. It is not suggested that every small undertaking through whose area the railway runs must be considered, as in many cases supply need only be obtained from the larger undertakings, but there is a limit to which this can be carried, and some concerns have not powers to supply outside their area. Over the London-Brighton line, a distance of only 50 miles, the current is obtained from five different sources, and the problem would become much more acute if a long stretch of main line were proposed for electrification.

For example, as things stand at present, if the L.M.S.R. wished to electrify the line from London to Glasgow, presumably it would want power at selected points at intervals of, say, 30 miles or so. Under existing conditions, the railway company would have to negotiate with each electrical supply undertaking in the areas passed through. A good deal of the opposition appears to be due to the fear that the Central Electricity Board will compete with the supply companies and supply power to the railways at less than cost price. But, as Sir Herbert Walker, General Manager of the Southern Railway, has pointed out in a letter to *The Times*, the board must satisfy the Electricity Commissioners (the judicial authority concerned) that the terms and prices under which current is supplied to the railways would not result in financial loss. From the point of view of the railway companies any reduction in tariff consequent upon a large consumption, while agreeable, is secondary to the advantages resulting from negotiations with one authority offering one tariff and one set of conditions. It is, indeed, almost essential for future conversion schemes of any magnitude that the railway companies should be allowed to negotiate direct with the Central Electricity Board, and it is little use politicians raising outcries against the inefficiency of non-electrified lines if almost immediately afterwards they retard progressive measures.

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South Australian Government Railways

RAILWAY operations during the financial year ended June 30, 1934, continued to reflect the prolonged world-wide economic depression. Due to the extremely low prices offering for wheat overseas, a large proportion of the wheat harvest was not railed to the seaboard, and the reduction of £182,079 in earnings from the carriage of wheat more than accounted for the total reduction of £173,904 in gross earnings. Ordinary working expenses increased by approximately £50,000 as compared with the previous year, of which £36,200 represents increases in the pay roll due principally to Federal awards. The balance is mainly accounted for by increased sleeper renewals, made necessary by the fact that a considerable mileage of lines which were constructed from twenty to thirty years ago are now reaching maturity in that regard. Mr. C. B. Anderson, Railways Commissioner, points out in his report that the drastic reductions in expenditure during the last four years definitely restrict the opportunity for further economies of a major nature, and that expenditure in certain directions shows a pronounced tendency to increase. The Commissioner also calls attention to the fact that the railways are called upon to pay interest on the capital cost, estimated at £10,800,000, of developmental railways, which, as railways, are not commercial propositions, though they have brought in large revenues

to the State in other ways. The surplus earnings over working expenses represent 1·8 per cent. on capital cost as compared with a return of 2·7 per cent. for the previous year. Results for the two years are compared in the accompanying table:—

	1933-34	1932-33
Average miles, open	2,529½	2,529½
Train-miles	4,930,271	4,909,588
Rail passenger journeys	16,325,004	16,074,221
Paying rail-borne freight, tons	2,141,637	2,387,817
Average haul, miles	123·32	118·12
Operating ratio, per cent.	79·20	72·36
Capital cost of open lines	27,782,787	27,772,779
Gross earnings	2,570,837	2,744,741
Expenses (including pensions)	2,036,110	1,986,167
Surplus	534,727	758,574
Interest, sinking fund, and exchange	1,375,438	1,446,646
Total deficit	840,711	688,072

Railway passenger receipts amounted to £516,253, a decrease of £3,024, and mails and parcels receipts were £6,149 lower. Minerals brought in £339,244, an increase of £11,738, and in the livestock receipts of £163,942 there was an improvement of £23,842, but goods were generally down. Goods train miles were reduced from 1,672,549 to 1,654,623 in continuance of the reduction effected during the past few years, largely as the result of the introduction of larger locomotives and freight rolling stock. Co-ordination with local carriers to ensure their acting as feeders to the railways is being effected in many instances following on the work of the Transport Control Board. Investi-

gations by the board have shown that a number of branch railways, which it was suggested might be closed, are paying more than working expenses, and where road and railway interests clash and some road transport is necessary, the board has decided on a policy of reserving the heavy traffic such as wheat, wool, superphosphates, cornsacks, and woolpacks, to the railway at approximately the cost of road transport. The conditions applying to transport for hire within the State have been extended to interstate carriers.

During the year under review, a thorough revision was made of freight and livestock rates, and also in the classification of commodities, and such alterations were, in the main, in favour of the trader, it being hoped that the inducements offered would attract new business and afford compensation for the concessions made. A considerable portion of the passenger traffic is now handled by petrol engined railcars, which are particularly useful in sparsely populated areas. The installation of high speed diesel engines as power units in railcars is receiving close attention, and one of the smaller type railcars has now been equipped with an 85 h.p. high speed diesel engine, the results to date of which are very satisfactory. The conversion of a larger type railcar with a high speed diesel engine of approximately 200 h.p. is also in hand. The workshops of the department are taking in hand the construction of six corridor passenger cars (first and second class), for use on main line express trains; also three Pacific type locomotives of about 25,000 lb. tractive effort, for use on both main and branch lines.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Southern Railway's Baltic Tank Rebuilds

The Old Mill House, Colwood,
Bolney, Sussex.
December 9

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have noted with interest the article appearing in your issue of December 7 illustrating and describing the former Baltic tank engine of the Southern Railway as rebuilt with tender.

I learned sometime ago that this rebuild was contemplated, and can quite understand the necessity of taking this step, as the only alternative was to take the engines out of service. The general outline of the rebuild is excellent, in fact, makes a beautifully balanced engine, the lines adapting themselves to the tender.

I only hope the tender has good riding qualities, as, on account of the short centres, the bogies are inclined to hunt unless controlled. The early South Western type suffered in this respect, in fact, after numerous alterations they were still, I believe, not quite satisfactory.

Yours faithfully,
L. B. BILLINTON

[As most of our readers are aware, Col. Billinton was Locomotive Engineer of the L.B. & S.C.R. from 1911-1923, and designed the Baltic tanks.—Ed. R.G.]

Rail v. Road Holiday Travel

Buenos Aires, Argentina.
November 10

TO THE EDITOR OF THE RAILWAY GAZETTE

If the rail wishes to regain some of the holiday travel now going by road, it must set out to provide a door-to-door passenger service, paying special attention to careful luggage handling and providing *en route* a punctual, appetising restaurant menu to suit all pockets. Heavy luggage sent in advance has now to be packed and ready with two days

anticipation, in order that the traveller may find it at his destination on arrival. A charge of 2s. a package for collection and delivery comes rather hard upon most families, so that on the actual day of departure there is a fair amount of hand luggage. By reducing the charge for a quantity and despatching same by a later train (though prior to the one being travelled in), there would be less hand luggage taken, so long as delivery at destination was attended to quickly.

The charge of 1s. a passenger ticket for a seat reservation, should be returnable on the journey being made, as under present conditions many families have to forego this facility, entailing an early arrival at the station with a long wait on the train or in a queue. It may at times mean standing in the corridor throughout the journey due to all seats being booked, or other travellers having got there beforehand. Portage charges and tips are less by car, in view of the fewer changes, and the holidaymaker who cannot afford such outlay passes many vexatious and perspiring moments at starting and destination stations when handling the family impedimenta, which is most numerous and miscellaneous when small children have to be provided for.

For those who do not want, or cannot afford, the full meal on the train, feeding arrangements leave much to be desired, and it is here that the motorcar gains, for a traveller can both eat at rest and choose his restaurant to suit his pocket. If there be two services on the train, the first may take anything from an hour to an hour and a half, and the second provides a late meal at full price with perhaps some of the dishes "off" the menu. Those not wanting the full meal then come in, too hungry to enjoy their food, and "fed up" (not in a restaurant sense) with the journey.

If the rail will only arrange the trip from door-to-door both for passengers and their luggage (heavy and light), so as to eliminate all inconveniences and annoyances, excessive tipping and extra charges, it has a good chance of getting back a large amount of this holiday traffic.

Yours faithfully,

A TRAVELLER

PUBLICATIONS RECEIVED

Verzeichnis der Dampflokomotivgattungen der Deutschen Reichsbahn. (Index of Steam Locomotive Types of the German State Railway). Third edition. By H. Maey and E. K. Born. 1932. Berlin: Verkehrswissenschaftliche Lehrmittelgesellschaft m.b.H. 8½ in. × 6 in. 51 pp.; 1 fig. Price 1.50 marks.—This small but exceptionally interesting and instructive work renders an important service to the railway world by placing on record a comprehensive index of the steam locomotives of the German State Railway Company. The engines are classified by type, with an explicit presentation of the appropriate designation letters and numbers, accompanied by statements of the former classification (in the case of the older locomotives) and of the years in which each series was built. Supplementary information is also tabulated where applicable. The schedule covers all the locomotives now or formerly in the possession of the State Railway, including some types going back to the middle of last century, and also indexes new designs which were standardised but not built at the time of going to press.

The introductory pages deal with all the principal methods of locomotive nomenclature on a comparative basis, and explain fully the significance of all the symbols used in the old and new German designations, extending not merely to the series code number and wheel arrangement, but also to the steam conditions, number of cylinders, compounding, axle load, motion work, and class of service. The value of the compilation will increase as years go on, and it makes generally available and easily comprehensible information which, we believe, is not published elsewhere in collected form.

Die Einheits-Lokomotiven der Deutschen Reichsbahn im Bild. (Pictures of the Standard Locomotives of the German State Railway.) Third edition. By H. Maey. Darmstadt: Verlag der Verkehrszentralamtes der Deutschen Studentenschaft. 8½ in. × 6 in. 34 pp.; 15 fig. Price 90 pfennig.—This brochure is the first of a series which supplements in an admirable manner the Index of Steam Locomotive Types of the German State Railway mentioned above. Introductory notes summarise the history of the evolution of the new standard locomotives from the 250 or so different types taken over by the State Railway in 1920. Particulars are given of the wheel arrangement, purpose and principal dimensions of the new standard machines, and the system of numbering and designation is explained. Finally, there are 14 full-page reproductions of photographs showing representative examples of standard and certain special types. This volume explains and illustrates the position as regards standard types and new constructions of locomotives at

the end of 1929. Later volumes in the series deal similarly with electric locomotives of the German State Railway; passenger coaches, mail and luggage vans of the German State Railway and Mitropa; and railcars of the German State Railway.

The Book of Speed. London: B. T. Batsford Limited, 15, North Audley Street, W.1. 10 in. × 7½ in. 150 pp. Price 5s. net.—Looking through this book on a stall we would have taken it to be a first-rate one for boys since it is full of dramatic and often beautiful pictures of aeroplanes, racing cars, motor cyclists, battleships and express trains. The captions do nothing to alter this impression, and it is not until one reads the short articles squeezed in between the pictures that one realises it is meant to appeal to the older reader. The introduction, which is by that well-known broadcast speaker, Commander Stephen King-Hall, is a reasoned vindication of the pursuit of speed. Briefly, its argument is that life is short and that high-speed allows one to crowd more experiences into its brief span. There follow articles by well-known authorities on the speedier forms of locomotion and a start is made with the aeroplane. We feel that there is a want of philosophic continuity here. It is true that the aeroplane travels faster than anything else, but surely the train deserves priority of place if the aim of fast locomotion is to help people get the most out of their lives? Trains carry hundreds and thousands of people where aeroplanes carry the merest handfuls. Steamships, too, deserve a much earlier place in the book if Commander King-Hall's criterion be accepted.

Putting the aeroplane first may be criticised for another reason: the importance of all recent increases of speed goes without question, but to anyone past middle age it must be obvious that their philosophic value is being greatly over-estimated in the imagination of the general public. In this book a good chance has been missed of presenting the facts in their proper perspective. An increase of 45 m.p.h. from 15 to 60 m.p.h. saves three hours on a 60-mile journey, but a further increase of 120 m.p.h. saves only 40 minutes. We see then, that even when considered *per capita*, the savings of time for which the aeroplane has been responsible are relatively far less important than those effected many years ago by steam. By cutting months and weeks off journey times, the train and steamship left only days, hours, or minutes to be shaved off by the aeroplane.

Having said that the introduction presents the viewpoint of the man, while the arrangement of the remainder conforms to a boyish sense of values, we have done with criticism. The pictures are wonderful, the articles

taken individually, being by such men as Sir Malcolm Campbell, Flight-Lt. Stainforth, Cecil J. Allen, and Engineer-Driver C. Peachy, are splendid, and we are going to give this book to all our nephews and heirs male this Christmas in lieu of the usual tip.

Belting.—R. & J. Dick Limited, Greenhead, Glasgow, sends an illustrated catalogue showing examples of power transmission by the firm's original balata Dickbelt, and by Dixit belting. Dickbelt is a production based on fifty years of experience and is claimed to combine smooth running and even tension with great pulling power and durability under arduous conditions of service. It is particularly suitable as a conveyor owing to its tough surface being able to withstand the abrasive action of the hardest materials. Dixit is a belting designed for high-speed service under conditions of exceptional humidity and heat, or where the drive comes into contact with acid or acid fumes.

Timken Tapered Roller Bearings.—We have received a copy of the "Timken Engineering Journal" which contains descriptions of the various types of Timken tapered roller bearings, as well as technical data on ratings, load calculation, bearing selection and other information pertinent to the mounting, use and maintenance of these bearings. It has been compiled for the use of engineers and designers, and is a weighty volume not only for the reason that it comprises 212 loose-leaf pages, but also on account of the immense amount of illustrated matter it contains. The information given in the volume is based on the knowledge and experience gained in the manufacture and installation of over 350 million Timken tapered roller bearings during a period of more than 35 years, and also on the extensive research constantly carried on in the manufacturer's experimental and testing departments.

The section entitled "General Information" will be of interest to engineers of all industries, and additional sections are available and cover such fields as conveyers, shop trucks, mine cars, cranes, machine tools, farm machinery, oilfield equipment, and aircraft. Other sections devoted to special industries are in process of publication, and will be supplied as completed to all who may be interested. The volume as it stands provides all the data that can possibly be required respecting the design, selection and application of the bearings.

In addition to the numerous sectional and half-tone illustrations, showing their construction both assembled and in dissected form, there is included a series of curves indicating speed ratings, torque output and the life expectancy of the bearings. The book is preceded by a comprehensive index, and the leaves are protected by stout covers of stiff board in black with gold lettering. The publication is entirely worthy of the eminent firm by whom it is issued. It indeed ranks as a very high example of technical trade literature.

THE SCRAP HEAP

In the day coach (U.S.A.) with the temperature rising and men sitting in their shirt sleeves, every so often a railwayman would come along and pack the water tank with crushed ice. There was more ice used on that train in a single day than I should see in a year in the shops of my own London suburb.—*John Gibbons in "Suburban Columbus."*

* * *

RAILWAY SURGERY

If things go on as they seem to be going now, I quite expect to hear that the Blarney Stone itself has been abolished. Now that the Cork and Muskerry "Puffing Billies" have been consigned to the scrap heap, half the joys of a trip to "the Stone" have vanished, for me at all events. What days they were! Those eight miles out and eight miles back, in themselves hours of joyous adventure! And now... a quarter-hour's bus ride, and hurry up for the return journey. And the old Tralee to Fenit, and Ballina to Westport joy-rides going too! What, I wonder, would the author of "Spanish Gold" find to give us a laugh about now if he had not deserted his little grey home in the west? But there it is! Railway surgery, like other operations with the knife, leaves its unpleasant memories. Yet it was surgery or mortification; and one wonders where it is going to end!—*From A Spectator's Note Book in "The Irish Builder and Engineer."*

* * *

A RAILWAY OBSERVATION TEST

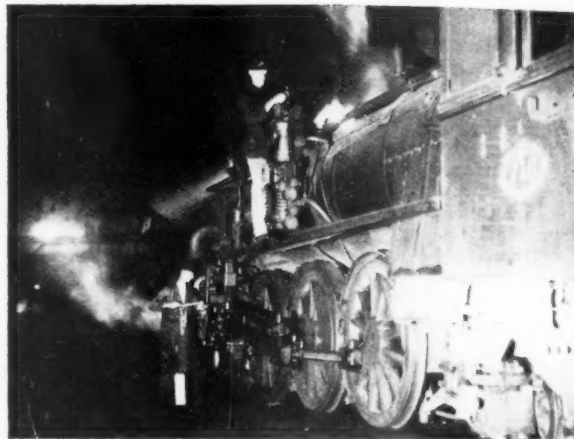
Although suggestive of a battlefield, the scene illustrated below is in the British Isles. Close study of the permanent way may reveal a peculiarity providing a clue to its whereabouts and to the name of the company which operated this now derelict line.



On Friday se'-nnight a new locomotive engine, called the *Eclipse* started from the Pen-y-dar-ran Iron Works, Merthyr Tydvil, with a load of 23 tons of bar and rod iron, which was delivered at the basin of the Glamorgan-shire Canal, ten miles from the works, in one hour and forty-eight minutes. The engine then returned with the empty carriages, crowded with passengers, whom the novelty of the occasion had attracted, and reached the works in one hour and forty-five minutes from the time of its leaving the basin, including all stoppages on the road for water. This was performed twice in the course of the day, and had there been occasion, it could have made another trip with the greatest ease. The following day it came up from the same point, drawing the same number of carriages, and conveying 145 passengers, in one hour and fourteen minutes, including stoppages; and, as preparations are being made to obviate the necessity of taking in water on the road, it is expected that the journey will be accomplished in future easily and safely in an hour. This engine was built at Newcastle-upon-Tyne by Robert Stephenson & Co., the celebrated locomotive engine builders, who have made those engines now travelling on the Liverpool & Manchester Railway. It has been much admired for the symmetry of its proportions, and being very low and compact in general appearance, conveys to the mind a pleasing idea of snugness and aptitude for the task assigned to it. The means of generating steam is so abundant that it was blowing off at the safety valve nearly the whole length of the journey forward and back, and the appearance of the engine altogether puts one strongly in mind of one of those low hull craft which, although buried in the spray and scarcely appearing above the water, yet sweep through it with the ease and swiftness of a dolphin. — *From the "Gloucester Journal" of Saturday, July 7, 1832.*

* * *

He was thinking that of all the forms of transport contrived by man, nothing seemed less dependent on him than a great railway engine. To see a ship under sail or steam is to think of the men who guide and humour her, and though an aeroplane may look



OILING UP.—A striking night snapshot by Mr. W. W. Stewart, at the Auckland locomotive depot, New Zealand Government Railways

like a bird or butterfly, it insists on remembrance of the controlling hands. It, too, is a reminder of human danger, but the engine, much less at the mercy of storm and mischance, seems to move by its own determination, to slacken its pace and glide into a station in the consciousness of a fine achievement. . . . — *From "The Curate's Wife," by E. H. Young, published by Jonathan Cape.*

* * *

THOSE WILD, WILD STATION BUTTERFLIES

The following is the reaction of *The Evening Standard* to our recent editorial note:—

Rare butterflies can sometimes be seen at the big London stations. *THE RAILWAY GAZETTE* describes how the railways the world over are gradually changing the distribution of flora and insect fauna. Seeds, clinging to the oil-clogged dust under railway coaches and wagons, it is stated, are carried in this way from country to country. Newman, the entomologist, knew a porter at Waterloo, who made a hobby of collecting butterflies and moths which had travelled up to London in trains, chiefly from the New Forest. Among his rare railway carriage finds were a fritillary butterfly and a much-prized spotted footman moth.

How exquisite at Charing Cross
The brave eschscholtzia looks
Like some sweet floral character
From Mr. Nichols' books.
How beautiful at Cannon Street
The marguerites arise
In staring pairs along the roof
Like Janet Gaynor's eyes.
In empty echoing waiting rooms
Where once escaped the gas
Fly comas and fritillaries
In multi-coloured mass.
Tread carefully in Fenchurch Street!
Amid the flowering weeds
Lurk vipers and tarantulas
And giant centipedes
And many an entomologist
With bottle, net and snare
Comes down to catch at Waterloo
The Purple Emperors there.

A.O

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

Possible termination of Mysore - M. & S.M.R. working agreement—Sorocabana improving revenue and developments—Paris Metro fares as revised—Success of the Yangtze train ferry at Nanking—Improved receipts and new chilled meat traffic in Queensland

INDIA

Mysore Railways

In 1937 expires the agreement under which the Madras and Southern Mahratta Railway operates on behalf of the Mysore Durbar, the 272-mile length of the Bangalore-Poona metre gauge main line that falls in Mysore territory. The sum paid in 1932-33 by the company to Mysore in respect of this working arrangement was Rs. 10.92 lakhs, nearly £82,000. The Mysore Government is now considering the question of taking over the management and operation of this length of line on the termination of the agreement.

Proposals for the extension of the Shimoga-Anandapuram line up to the Gersoppa falls and for the construction of a railway between Bangalore and Hosur are before the Mysore Government, but precedence will possibly be given to the linking of Chamrajnagar with the South Indian Railway, for which negotiations with the Government of India are proceeding.

BRAZIL

Sorocabana Railway

The following are the financial results of this railway in 1933, compared with the corresponding results in the previous year:—

	1932 contos.	1933 contos.
Gross receipts	67,969	80,267
Expenditure	55,219	58,845
"Net" receipts	12,750	21,422
	per cent.	per cent.
Operating ratio	81.24	73.31

The renewal-fund, built up by means of a 10 per cent. surcharge on all rates and fares since February, 1927, showed a balance of 3,446 contos at the end of 1933, 49,096 contos having been paid in and 45,650 withdrawn. Chief among the improvements effected were the doubling of various sections of line, the erection of new buildings, including an up-to-date station at São Paulo, and the acquisition of rails and equipment generally. The capital account stood at 216,995 contos, a sum which represents expenditure as from July, 1919, when the contract drawn up between

the Sorocabana and the Brazil Railway Company was rescinded.

Road Traffic

Receipts from goods conveyed by Sorocabana road-vehicles are not included in the total given above: they brought in 1,210 contos during 1933. The road services, first introduced by the Sorocabana in 1930, were the pioneers of their kind in Brazil. They continued to make satisfactory progress in 1933, new centres of operation being opened up in Itú, Botucatu and Piracicaba.

It is hoped that, when the programme of improvements on the North-Western of Brazil system—in which the Sorocabana and Paulista Railways are financially and materially interested—is concluded, a complete system of co-ordination, involving rail, road and air services, will be introduced, extending from the port of Santos to the remote regions in the State of Matto Grosso and the frontiers of Paraguay, Argentina and Bolivia. These will greatly enhance local, inter-state and international communications, and, *ipso facto*, the trade relations between the various countries concerned.

Mayrink-Santos Construction

On the Mayrink-Santos extension, 135 km. in length, 62½ km. are ready and open for traffic; 24½ km. have the rails laid and are ready to be inaugurated; a further 12 have the rails laid and are practically ready, and on the final stretch of 36 km. the road-bed has been prepared and all that remains to be done is a certain amount of reinforcement and bridge-work. The total amount expended on this extension amounted, on December 31 last, to 222,480 contos, or just over 3½ millions sterling at the official exchange-rate.

New Electro-Mechanical Interlocking Installation

A new electro-mechanical signal cabin, in which the entire installation—locking-frame illuminated diagram, block-apparatus, &c.—is of local manufacture, has recently been installed at Santo Antonio, an important junction on the Sorocabana 140 km. from São Paulo, where the line to Itararé, the

São Paulo-Rio Grande Railway and the Uruguayan frontier leaves the main route to Botucatu and Baurú. This new cabin was fully justified both by the increasing traffic on this section of the Sorocabana system and also by the fact that, apart from the movement of trains through the station itself, shunting in four distinct yards, each one of considerable extent and capacity, has to be efficiently controlled.

The locking-frame contains 96 levers, which operate, inter alia, 45 sets of points mechanically and 4 sets electrically, the furthest of the latter being situated 1,000 m. from the cabin. Signalling is both automatic and semi-automatic, and all lines within station-limits are fully track-circuited. The block-apparatus linking up Santo Antonio cabin with the corresponding cabins of Bagaetava, Boituva and Americana, in the directions of São Paulo, Botucatu and Itararé respectively, is operated on what is known as the "Bertacin" system. With the inauguration of this cabin the Sorocabana now has 21 of the same type, three additional ones, at Botucatu, Rubião Junior and Alcantis, being in course of construction.

FRANCE

Fares on Paris Metro Extensions

The Conseil d'Etat (State Council) has recently given its approval to a supplementary agreement between the Paris Metropolitan Company on the one hand and the City of Paris and the Department of the Seine on the other, modifying the operating conditions of the company's lines and suburban extensions. The modifications comprise certain changes in the financial relations of the company with the city and department, as well as in the fares. The question of fares was dealt with in the original agreement drawn up in 1929 to provide for the Metro suburban extensions. It was then agreed to issue three kinds of tickets: urban (Paris), suburban and mixed tickets.

But in face of the difficulties and cost of controlling the application of three kinds of ticket, the Metro authorities decided that it would be better to have only one ticket (first or second class) for the area including Paris and the present short suburban extensions. This system of a single fare (first or second class) was sanctioned by the supplementary agreement and has been applied to all the extensions. The inner suburbs have thus been combined with the City of Paris to form one area for the purpose of fares and one ticket (70 centimes second class or 1 franc 15 centimes first class) now takes a passenger from any point in the area to any other. He may take his ticket in a suburb on one side of Paris and travel to or through the city to a suburb on the

other side. Thus, a ticket taken at the Château de Vincennes in the eastern suburbs will carry the passenger to the Pont de Sèvres on the west of Paris, and the same fares levied in Paris for a number of years past now cover also the suburban area, and no increase is made for travel on the extended lines. It is possible, however, that the company may seek to raise the fares in the near future for Paris and the inner suburbs combined in order to cover the costs of the extensions. It is certain that when the proposed further extension of the lines into the outer suburbs to distances of ten miles or more is carried out, increased fares on those sections will be necessary.

The supplementary agreement divides the existing and proposed suburban lines into two zones: (1) the first zone comprising the short extensions and (2) the second zone including further extensions. For the purpose of fares, the first zone is attached to the Paris system of lines and the combination forms what is known as the "réseau d'extension" (extension system). The existing Paris fares are applicable to the whole of this system.

Paris Tramways and Bus Company's Difficulties

The Paris company which runs the tramways and motor buses anticipates a deficit of 60,000,000 fr. for the current year. Traffic receipts have constantly decreased during the year, except in February when there was a taxi strike. The decline is due not only to the trade depression, but also to the increasing competition of new Metro lines, as well as taxis, the latter often competing with the motor bus system at night by picking up numbers of passengers at competitive fares.

THE FAR EAST

Tientsin-Pukow Railway

The construction of a branch line of the Tientsin-Pukow railway at an estimated cost of Chinese dollars 2,000,000 is being considered by the Ministry of Railways. Its purpose is to develop outlying districts of the Anhui Province and encourage local industries. The new line, which will be 54 miles long, will connect Chengyangkwan with the main line at Pengpu.

Nanking-Pukow Train Ferry

The Yangtze River train ferry between Nanking and Pukow, inaugurated a year ago, has proved very satisfactory. It has effected a considerable saving of time in the through Shanghai-Peking express services, and the inconvenience to passengers crossing the river has been avoided. The revenue from passenger traffic during the year has averaged \$8,000 a month. Meanwhile, freight traffic has shown an average revenue of \$50,000 a month, with the exception of the first month,

when there was a small operating loss on the ferry service during the initial stages and before the new working arrangements were effected. The abolition of break of bulk, double handling by coolies, and transfer across the river by boat of thousands of tons of traffic, has been responsible not only for a considerable saving in labour costs, but also in damage to goods and avoidance of loss through pilferage. The daily average tonnage carried by the ferry during the year was over 2,600 tons.

MEXICO

Six-Year Railway Plan

It is stated on good authority that if the National Revolutionary Party adopt the six-year plan of industrial development, over 1,500 miles of newly constructed railway will be added to the Mexican National Railways system. The four principal projects embraced in the plan are intended to fill gaps in the existing system and render large tracts of rich land available for development. The total estimated cost of this railway expansion, which, it is expected, will soon be started, is about 60,000,000 peso.

QUEENSLAND

Improving Traffics and New Chilled Meat Exports

Traffic for the past few months has been abnormally brisk, marked activity in all classes of business having developed. Revenue for the current financial year to date has substantially exceeded anticipations. Stock movements have been very heavy, many thousands of cattle and sheep being carried from 1,000 to 1,400 miles with a negligible percentage of loss.

The first shipment of chilled meat on a commercial scale from Queensland to England was made from Port Alma near Rockhampton in September. The meat was conveyed 43 miles from the Lakes Creek meatworks to port in specially fitted wagons which had been loaded in an enclosed chamber adjoining the chilling rooms. So far as can be ascertained the shipment was satisfactory and others have been made since. If the business develops successfully an impetus will be given to the meat industry of Queensland.

General Improvements

An extensive programme of improvements in track, bridges, stations, &c., has been undertaken of late. Several low level bridges between Townsville and Cairns are being raised with the object of minimising delay to traffic during flood periods. In some parts of this area the rainfall in one year exceeds two hundred inches. Strengthening of bridges and relaying are also

going on, and concrete roadways are being laid down in the vicinity of the goods sheds at the principal depots. The train control telephone system has also been considerably extended. An experiment is to be made by fitting a diesel oil engine in one of the railcars in use. The engine, which is of 130 h.p., was bought recently and is to be placed in an A.D.C. car.

Staff Matters

The desire of the staff to co-operate in securing increased efficiency is manifested in the activities of the Inventions and Suggestions Board, which has dealt with 16,000 proposals in the past fourteen years and adopted 2,290 of them.

The balance of superannuation deductions which had been withheld for a number of months was refunded to contributors a few weeks ago. The Government is still under obligation to the extent of £84,000 p.a. to meet payments of pensions to those who had retired prior to the repeal of the Superannuation Act.

JUGOSLAVIA

Extensive New Works

Several new lines of great importance are now being constructed by the State Railways, the chief of which is that from Pozarevac, near Belgrade, to Kucevo, 61 km., which is to form part of a new trunk route from Belgrade to Bucharest and Odessa. The Yugoslav portion is being constructed gradually, and when the Danube is reached near Orsova, the co-operation of the Roumanian State Railways will be sought for the building of a large bridge over the river. There are numerous tunnels and viaducts on the section now being constructed.

A new line 86 km. long is being built from Veles on the Belgrade-Salonika main line to Prilep, whence there is an existing standard gauge line to Bitolj (Monastir). The new line will include a tunnel 1½ miles long and follows a route over the Babuna Pass. The Prilep-Bitolj line, 44 km. in length, was opened in April, 1931, but previously communication had been provided by means of a 2 ft. gauge line which was continued from Prilep to the Belgrade-Salonika main line at Gradsko. The completion of the standard gauge line between Veles and Bitolj gives direct connection within Yugoslavia to an important and fertile region in Southern Serbia and avoids the necessity of the former detour through Greek territory.

A railway is also being built from Belgrade to Pancevo, 26 km., and will cross the Danube by a bridge 1,400 yd. long. Finally, the 70-km. line recently opened from Pristina, on the Belgrade-Skopje line, to Pec, will be prolonged to the shores of the Adriatic in the neighbourhood of Cetinje.

IMPRESSIONS OF OVERSEAS TRANSPORT

IV—Modernity and the out-of-dateness respectively help and hinder the gigantic traffic problem of New York. The Grand Central terminal described

By A. W. ARTHURTON, formerly Secretary, British Railways Press Bureau

THIS was my first visit to New York and I was interested to see if it came up to my expectations.

Frankly it did not from a transport point of view, although there is no denying that it is a remarkably fine city and that the grace and beauty of its buildings—the so-called skyscrapers—are almost beyond belief. It seemed to my casual glance—I was there only a couple of days—a mixture of modernity and out-of-dateness. Magnificent terminals like the Grand Central and the Pennsylvania can scarcely be surpassed in any country, while the main line services, which are carried underground into the city and hauled by electric locomotives, seemed to be excellent. The subways, or underground electric railways, however, were most dingy and reminded me of the old days of the London Underground. In the streets, too, the hideous elevated railway mars many of New York's thoroughfares with its wooden staging. I naturally enquired why this blot on otherwise magnificent streets cannot be replaced by something more modern, and was informed that vested and political interests were the obstacles. The subways and the elevated, with their 5-cent fare, are undoubtedly a boon to many thousands of New York workers and could, I suppose, scarcely be dispensed with.

The street cars—or trams—also appeared to me to be anything but modern, while the buses, single deckers, are of even older type, resembling the kind which have been discarded in London for a long time. Here again, I suppose, both street cars and buses are indispensable, but I expected to see something more up-to-date. Taxis and private automobiles crowd the streets and coloured lights control the traffic, but stops are necessitated at almost every crossing, and more than once I found that the quickest means of getting to a place was either by walking or using the subway.

The authorities in New York, as in England, are seriously concerned over the number of street accidents and a big effort has been made in recent years to reduce the number of casualties and accelerate the improvement of traffic conditions generally. Comparative figures of killed and injured in London and New York are:—

LONDON		NEW YORK	
1933—660 killed ;	26,754 injured	516 killed ;	22,578 injured
1934—676 killed ;	27,886 injured	486 killed ;	21,444 injured

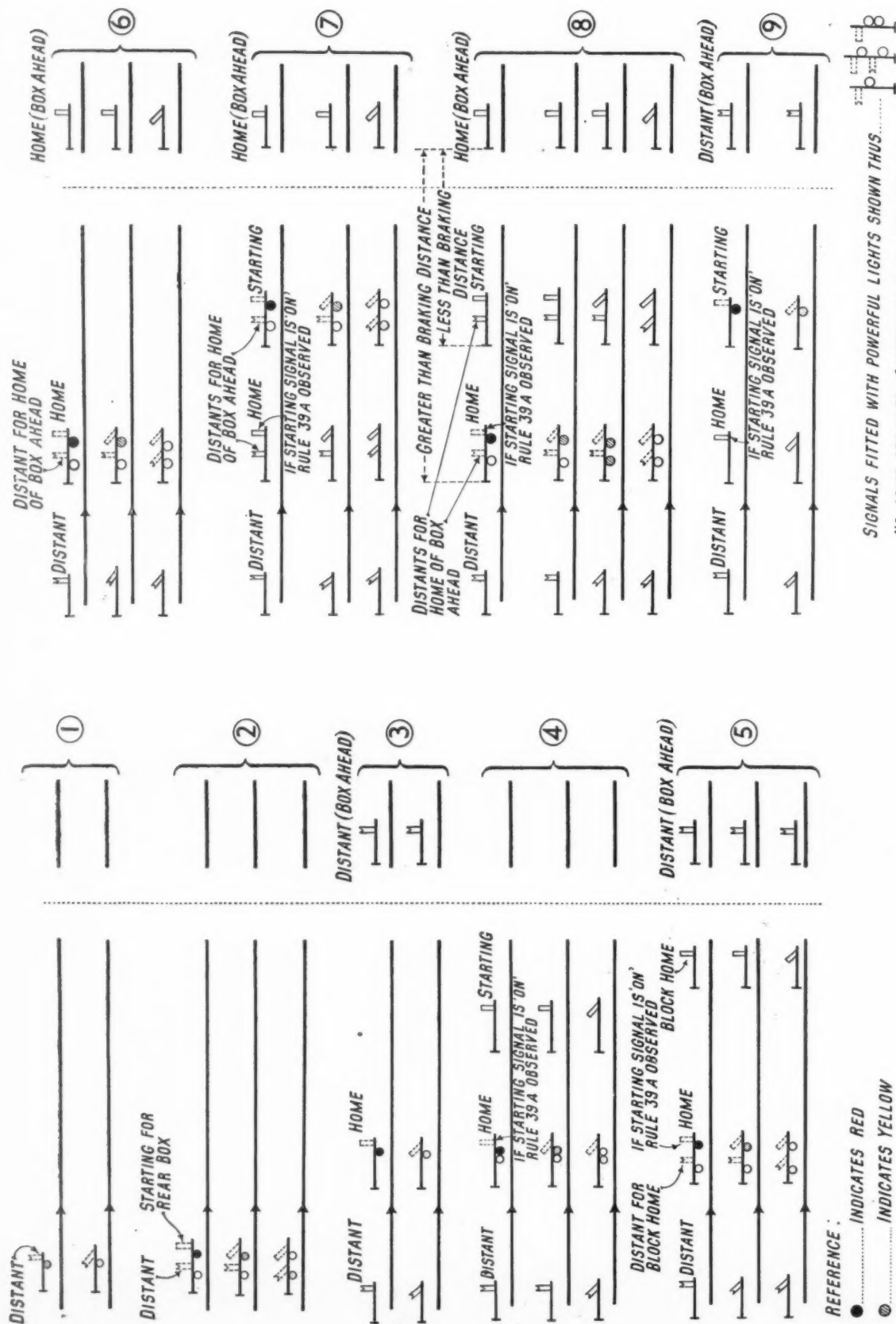
One of the main reasons for traffic congestion in New York is the skyscrapers. These immense buildings, towering above Manhattan, house an enormous working population which streams in every morning and out again in the evening at about the same times. The result is chaos. Thousands of cars and pedestrians become hopelessly entangled in the streets and long lines of traffic are held up for minutes on end. This state of affairs can only be altered for the better by erecting, at great expense, more railways and more elevated highways. A beginning has been made in this direction. A new elevated highway is being constructed which, when completed, will run the total length of the west side of Manhattan Island parallel to the docks, thus assisting motorists to avoid congestion on Broadway and enabling them to get into and out of the city more quickly. Skirting the shores of the Hudson, the new elevated road will eventually

extend as far as the Washington bridge, which links New York with New Jersey. It will have four lines of way, two on each side of a raised portion with lamp standards, and will cost £3,000,000 to build.

The Grand Central terminal is not only a station but a great civic centre, as some of the city's largest hotel and office buildings have been erected over its yard tracks and the profitable utilisation of these air rights is on a scale without precedent. It is owned by the New York Central Railroad Company and is also used by the New York, New Haven & Hartford Railroad. It was opened in 1913 and with its subsidiaries covers 79 acres northward from 42nd Street. I was told that more than 700 trains enter and leave the station daily. Approximately 30,000 through passengers and 60,000 season ticket holders arrive or depart daily and 60,000 non-passengers enter the terminal every day, many of them from the subways which have stations connected with it. The floor space of the station, it is said, can accommodate 130,000 people at a time. Trains enter and depart from the station on two levels. The lower level is devoted mostly to trains with season ticket holders while on the upper level many of the best known trains are handled, including the famous Twentieth Century Limited, the fastest train in the world that covers more than 900 miles daily. On the upper level are 41 tracks and on the lower level 39 tracks. More than 2,000 men are employed in the operation of the station.

The world's biggest sub-station, whence comes the electricity to operate the trains, is located in the bed rock 100 feet below 43rd Street. It also distributes light, heat and power to 60,000 persons, occupying 256 acres of floor space around and above it. Power from it operates 325 elevators in 28 terminal area buildings and it supplies to these buildings the steam that heats some and the hot water that heats others. The station has its own hospital and its own police force. Its information bureau answers a million and a half enquiries yearly. It has scores of shops and several restaurants, and is connected directly by underground passages with three large hotels and numerous office buildings. The main concourse, one floor below street level, is regarded by many as one of the most beautiful rooms in the world. It is 275 ft. long, 125 ft. wide and 125 ft. in height, and at each end are arched windows 75 ft. high. In the station area are 32 miles of track and a novel feature is the use of ramps instead of stairways. All trains in and out of Grand Central terminal are operated electrically, no steam locomotive now being used in New York. Electric operation of trains continues as far north as Harlem, 32 miles distant.

Directly in the rear of Grand Central terminal is the mammoth New York Central building, 567 ft. high, straddling Park Avenue between 45th and 46th Streets. At the latter street the vehicular traffic for Park Avenue goes directly through the building on ramps rising to viaducts encircling the station. These viaducts join at the south side of the station and pass over 42nd Street, descending to the street level at 41st Street. In this way the tremendous north- and south-bound traffic is separated from the cross-town traffic, which in this area is extremely heavy.



ASPECTS ADOPTED FOR MECHANICAL COLOUR-LIGHT SIGNALLING, NORTH EASTERN AREA, L.N.E.R. (See article opposite)

MECHANICAL COLOUR-LIGHTS FOR THE N.E. AREA, L.N.E.R.

Upper quadrant spectacles worked from the signal box by the ordinary mechanical methods give colour-light indications in an interesting L.N.E.R. (N.E. Area) signalling installation

IN view of the increasing use of colour-light signalling, it was decided some time ago to conduct experiments to discover whether certain of the advantages of the system could be adapted to mechanical signal installations. The chief benefits in mind were the abolition of fogmen and the ability to give drivers additional information as to the state of the road ahead.

The general method of installing these powerful electric lamps is to provide an upper-quadrant spectacle at the level of the driver's eye and a lamp of the Adlake or Cooke type behind it. The Adlake lamp was described in

of 6 W. capacity and a secondary filament of 4 W., both at 6 V. No auxiliary light is provided, for should the main filament burn out, the secondary one will give an adequate but slightly inferior light. The spectacle and light are repeated in the signal box concerned on a five-position needle type indicator, the five positions of the indicator reading as follow:—

- (1) Spectacle "on," light in; (2) Spectacle "on," light out
- (3) Wrong; (4) Spectacle "off," light out; (5) Spectacle "off," light in.

This method is specially economical where there was a repeater for the semaphore arm, as the same wire can be utilised.

The aspects are arranged so that a yellow invariably precedes a red, thus avoiding a powerful green light leading up to a red, a situation which would result in a very misleading indication being given to a driver. To accomplish this, an extra lamp and spectacle are provided on the home signal and worked by the same lever as that operating the starting signal. Only one aspect, either red, yellow or green, is displayed at one time. The lamp behind the appropriate spectacle is lit by circuit closers attached to the spectacles. Similar arrangements are made where the starting signal and the distant for the box ahead are combined on the same post; in this case the differentiation between the yellow and green being dependent on the distant signal lever of the advance box.

Where necessary, the arrangements have been amplified to cover the case of junction splitting signals and to provide a double yellow aspect in certain cases. The accompanying diagram illustrates in detail the aspects adopted.

This type of signal incorporates several of the advantages of the modern colour-light, and is much less costly to instal. The cost of maintenance is also smaller. About a hundred of these lamps have recently been installed on the North Eastern Area main line between Northallerton and Alnmouth, a distance of 85 miles. Previous to their installation, most distant signals and certain home signals were fitted with Raven's mechanical cab-signalling apparatus, but owing to increased inter-area engine working, it was considered more economical to instal powerful lights and to withdraw the Raven apparatus. Fogsignalmen are not employed where powerful lights are provided.

The pioneer schemes at Hunwick which incorporated these mechanically worked colour-light signals, was described in our issue of November 6, 1931. That at Wiske Moor-Cowton was covered by our article in our contemporary *The Railway Engineer* of January, 1933. It may be remarked that in the Hunwick installation the original incandescent lamps which were put into service in May, 1931, are still in use.

The work and experiments have been carried out in collaboration with and to meet the requirements of Mr. C. M. Jenkin Jones, Superintendent, and Mr. C. M. Stedman, Locomotive Running Superintendent, North Eastern Area, L. & N.E.R. Installation was under the instructions of Mr. John Miller, Engineer, North Eastern Area, to the designs and under the supervision of Mr. A. E. Tattersall, Signal and Telegraph Engineer, North Eastern Area.



Down home signals at Black Banks. The upper lights show red or yellow and the lower green. That on the left is a calling-on signal

our issue of March 28, 1930, and the Cooke lamp in our issue of June 9, 1933. They are found to be extremely efficient in use. The spectacle, from which the arm has been removed, is worked in exactly the same manner as the previously existing semaphore. It was considered that, if the arms were removed the drivers would treat these signals as colour-lights and, as the aspects shown conform to colour-light principles, this feature was considered desirable. As the majority of the installations are in country districts remote from any suitable power supply, approach lighting from batteries has been adopted. The trouble often experienced with multi-lens colour-light signals due to phantom indications does not occur with the mechanically worked signal as any extraneous light falling on the lamp serves only to increase the aspect displayed at the time.

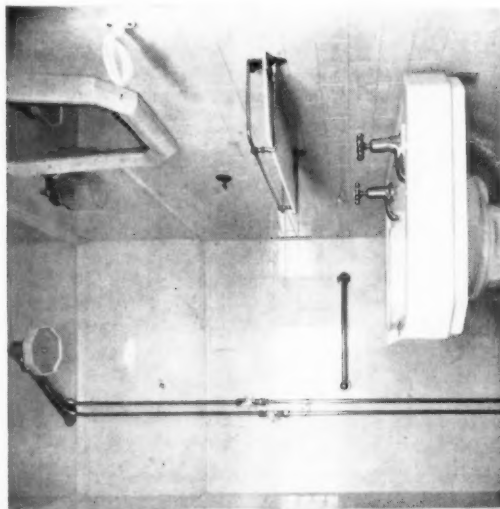
Double filament lamps are used, with a main filament



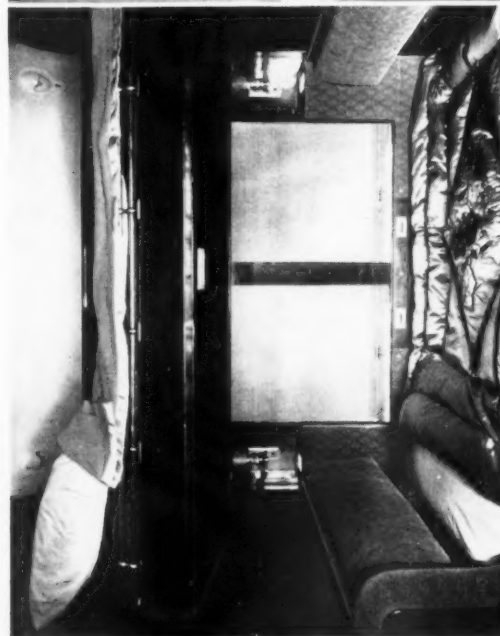
Observation saloon



Dining saloon



Toilet and shower bath



Sleeping compartment



Corner of the kitchen

COMMISSIONER'S INSPECTION CAR, SOUTH AUSTRALIAN RAILWAYS (See article on facing page)

COMMISSIONER'S INSPECTION CAR, SOUTH AUSTRALIAN RAILWAYS

This modern vehicle, named "Murray," was completed in September and first used by the Duke of Gloucester

A NOTABLE addition to the broad gauge passenger stock of the South Australian Railways is the new Commissioner's inspection car which was completed at Islington in September last. It was used first by H.R.H. the Duke of Gloucester on his recent visit to South Australia and is considered to be the most up to

used in the construction of the bogies, and the walnut for panelling, the whole of the material is of South Australian manufacture. Electric light, supplied from a generator and batteries, is provided throughout. Special Holophane reflectors and shades in oxidised silver fittings are fitted to give an even distribution of light.



South Australian Railways royal train for the Duke of Gloucester's journey from Terowie to Adelaide on October 11 and 12 last. The new inspection car is the second vehicle

date car of its kind in the Commonwealth. The principal dimensions are:—

Length over buffers	78 ft. 2 in.
Length over body	72 ft.
Width	8 ft. 10½ in.
Centres of bogies	53 ft. 2 in.
Bogie wheel base	11 ft.
Axle journal	9 in. x 4½ in.

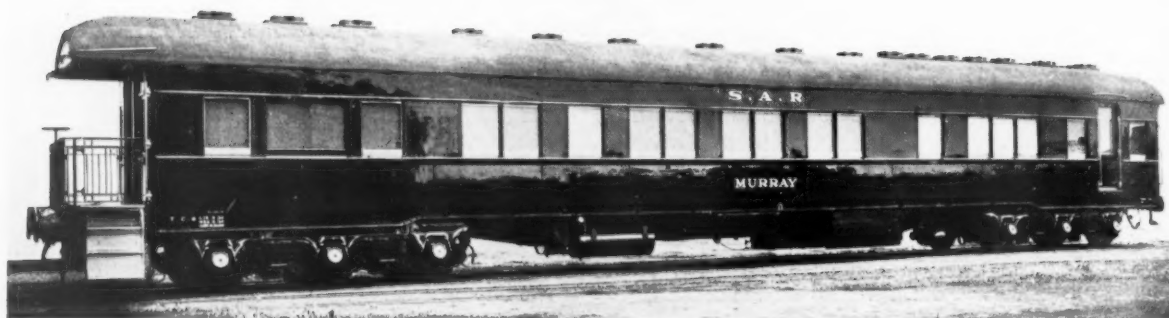
Many new and interesting structural features are embodied. The carriage has a wooden body with steel panels, carried on heavy fish belly centre girders and running on two six-wheel cast steel bogies. The ends of the car are protected with an anti-telescopic device consisting of heavy rolled steel sections built into the car body and secured to the underframe. Special louvre compartment doors are an innovation for this class of car, permitting free air circulation.

Framing is of Tasmanian blackwood with sliced Queensland walnut panels; the whole interior is given a rosewood finish. The exterior is painted in the standard brown of the South Australian Railways with special synthetic enamel finish. With the exception of the special steel

The carriage is of the corridor type with an observation saloon at the rear end. It has four state rooms with sleeping berths for eight persons, and two additional berths in the observation saloon. The other arrangements comprise a kitchen, shower bath, lavatory conveniences, and a dining saloon with seating accommodation for eight persons. An outside car platform has been arranged at the end of the observation saloon with steps to permit boarding the car from ground or platform levels. The vehicle is fitted with the Westinghouse automatic brake, the rigging of which is arranged for clasp braking.

The observation saloon, which is 14 ft. 3 in. long by 8 ft. 10½ in. wide, is fitted with a domed ceiling. It is equipped with comfortable lounge chairs upholstered in blue moquette. A settee is finished in the same material and above this is a built-in wireless set. The light fittings are finished in oxidised silver and wire screens have been fitted to the windows. Ample side window space has been provided and windows at the end of the saloon give a clear view along the track.

Next to the observation saloon is the Commissioner's private suite. It is fitted with a special double wardrobe



New 5 ft. 3 in. gauge Commissioner's inspection car for the South Australian Railways

and opens into a bathroom with shower, porcelain wash-basin, and w.c. Then follow three other state rooms, each with sleeping accommodation for two persons. The berths are arranged longitudinally, the top berth folding against the ceiling when not in use. For day use, the lower berth is converted into two window seats facing each other. Each state room has two wardrobes and a wash basin. The next compartment has toilet conveniences, including a separate enclosure for shower bath. Hot and cold water is provided to the washbasin in each state room. The water supply of the car is controlled by Stone's electro-pneumatic water-raising device. All state room mirrors are of tinted glass to harmonise with the interior finish of the woodwork.

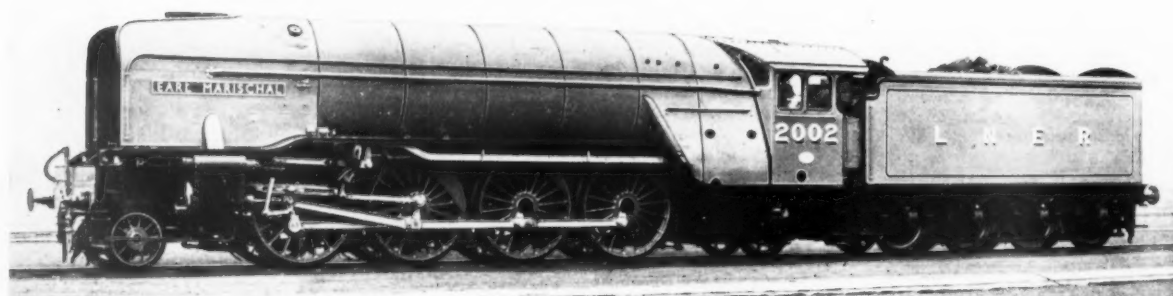
The kitchen, so arranged that the service to the dining room is through a servery, is fitted with modern appoint-

ments, such as electric refrigerator, hot water service, hot water tank and plate-heating racks, cupboards, and Monel metal sink and drainboards, with a wood fired stove. It also contains a recessed wardrobe for the attendant's use.

At the front end of the carriage is the dining saloon 11 ft. 6 $\frac{3}{4}$ in. long, which has seating accommodation for eight persons. The saloon also is fitted with a domed ceiling. An extension table, a special feature of which is the ease and rapidity with which it can be extended, is arranged longitudinally along the saloon.

Four spring-wound wall clocks have been provided, one each in the observation and dining saloons, the Commissioner's private suite, and the kitchen. Electric fans have also been provided. In addition, electrical tachometers have been installed in both the dining and observation saloons to indicate the speed in miles an hour.

L.N.E.R. 2-8-2 TYPE LOCOMOTIVE, "EARL MARISCHAL"



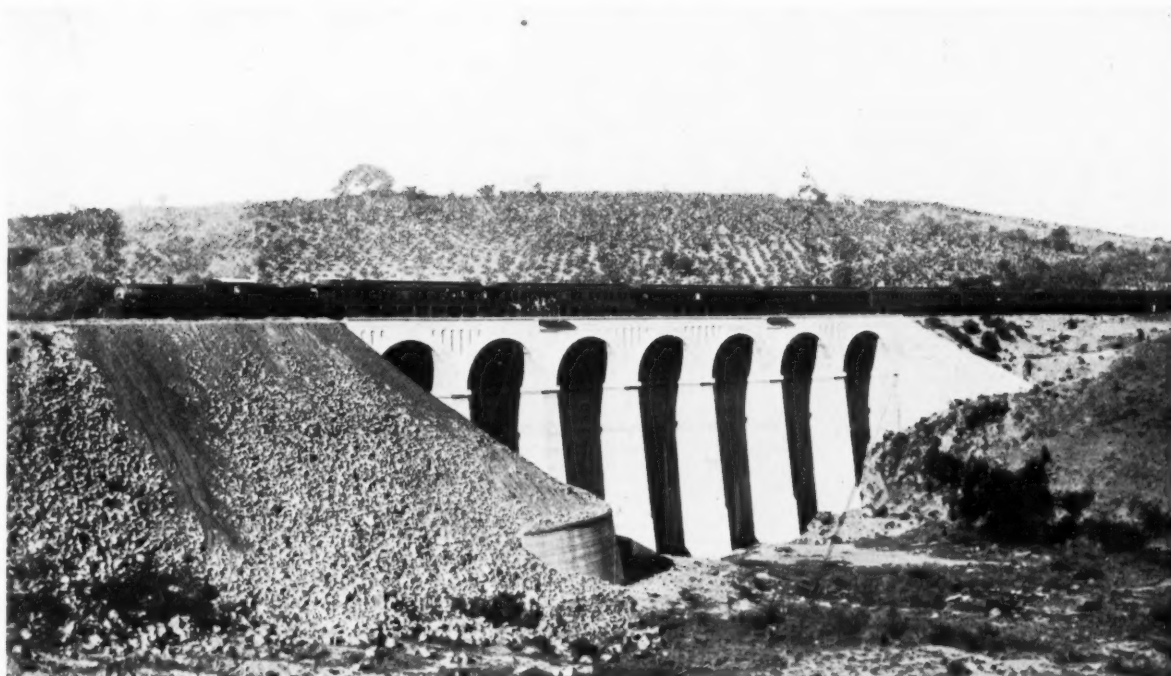
BY the courtesy of Mr. H. N. Gresley, Chief Mechanical Engineer of the L.N.E.R., we illustrate the second P2 class 2-8-2 type locomotive to be built at the Doncaster works, No. 2002, *Earl Marischal*. This engine incorporates many of the features of its predecessor No. 2001, *Cock o' the North*, which latter is now at the locomotive testing station at Vitry, near Paris. There are, however, some differences between the two engines, and a comparison of the photograph now reproduced with that appearing in our issue of June 1, 1934, will serve to show how these affect the appearance of the locomotive.

The *Cock o' the North* is equipped with poppet valves and gear, whereas No. 2002 has piston valves, operated by Walschaert-Gresley gear of similar pattern to that fitted on the L.N.E.R. Pacific engines. The piston valves are 9 in. in diameter and have a maximum travel of 5 $\frac{5}{8}$ in. The steam lap is 1 $\frac{5}{8}$ in. for the inside cylinder and 1 $\frac{3}{8}$ in.,

for the outside cylinders, and there is no exhaust lap. The cut-off in full gear is 65 per cent. The running board, which in No. 2001 was carried straight along from the firebox to the front end, now curves downwards to the rear of the cylinders. The three 21 in. by 26 in. cylinders drive, as before, on to the second pair of coupled wheels. Further, it will be noticed that the reversing rod is now below instead of above the running board, this, of course, being due to the different type of valve motion.

No. 2001 is equipped with the A.C.F.I. feed water heating system, the pump being fixed to the running board on the right hand side of the engine immediately to the rear of the smokebox, whereas engine No. 2002 has a Davies & Metcalfe exhaust steam injector.

The tender, as before, is of the high-sided eight-wheeled type fitted to the Pacific engines, with a water capacity of 5,000 gallons and a coal capacity of 8 tons.



Viaduct near Cavendish, Natal, on the Cato Ridge-Clairwood doubling



New bridge under construction across the Umlaas River, Natal
NEW WORKS ON THE SOUTH AFRICAN RAILWAYS



Aerial view of the extensions at Cherbourg. The roadstead where liners formerly anchored is seen in the background, beyond the mole



The spacious waiting hall at Cherbourg Maritime station. The hall is on the first floor and situated over the carriage sidings (See article on page 985)

RAILWAY NEWS SECTION

PERSONAL

We regret to record the sudden death of Colonel William McLellan, C.B.E., partner in Messrs. Merz & McLellan, Consulting Engineers, Westminster.

L.N.E.R. APPOINTMENTS

The London & North Eastern Railway announces the following appointments:—

Mr. T. R. Greenside, Locomotive Accountant, Darlington, to be Secretary of the North Eastern Railway Superannuation Fund and the North Eastern Railway Bank of Deposits in succession to Mr. G. S. Swordy, who is retiring from the service at the end of the year.

Mr. L. C. Glenister, Chief Accountant's Office, King's Cross, to be Locomotive Accountant, Darlington, in succession to Mr. T. R. Greenside.

Mr. M. A. Cameron, Passenger Manager's Office, Liverpool Street, to be Assistant District Passenger Manager, London, in succession to Mr. L. E. Marr, appointed District Passenger Manager, York.

Mr. F. S. Chilvers, Superintendent's Department (Eastern Section), Liverpool Street, to be Assistant District Superintendent, Stratford, in succession to Mr. H. F. Sanderson, appointed District Superintendent, Cambridge.

Mr. W. Y. Sandeman, District Engineer, Northern District, Southern Scottish Area, to be District Engineer, Western District, Southern Scottish Area, in succession to Mr. J. C. L. Train, appointed Assistant Engineer (Maintenance), Southern Area.

Mr. W. Russell, Chief Assistant (Constructional), Engineer's Office, Edinburgh, to be District Engineer, Northern District, Southern Scottish Area, in succession to Mr. Sandeman.

Mr. T. C. Parker has been appointed to officiate as Deputy Chief Accounts Officer, Burma Railways, as from October 30.

Major R. K. Hubbard, O.B.E., Stores Superintendent, Central Argentine Railway, sailed for the United States and England on leave on November 3.

Mr. John A. Meelboom, Assistant to the General Manager, Central Argentine Railway, returned from England on November 6.

The Board of Directors of the South Indian Railway has appointed Mr. C. A. Muirhead, the present Deputy Agent, to succeed Sir Percy Rothera, O.B.E., as Agent when the latter retires early next year.

Mr. Muirhead, who was educated at Cheltenham College, was appointed in London by the late Sir David Yule to Andrew Yule and Co. Ltd., and went out to India in 1908. He joined the South Indian Railway in 1924, as Senior Assistant Secre-



Mr. C. A. Muirhead,
Appointed Agent, South Indian Railway

tary to the Agent, and in 1928 was promoted to be Secretary to the Agent. Mr. Muirhead acted as Deputy Agent from March 1930 to June 1931, when he was confirmed in that appointment. From March to October, 1933, he acted as Agent in the absence of Sir Percy Rothera on leave, and, when Sir Percy retires early next year, Mr. Muirhead will succeed him as Agent.

In connection with Sir Andrew Duncan's appointment recorded in THE RAILWAY GAZETTE of November 23, the Ministry of Transport now announces

the appointment of Sir Archibald Page, M.Inst.C.E., M.I.E.E., to succeed him as Chairman of the Central Electricity Board as from January 1 next. Sir Andrew Duncan has, however, been appointed an ordinary member of the board as from the same date in place of Lord Barnby, resigned.

Sir Archibald Page has been General Manager of the Central Electricity Board since 1927 and in that capacity has been closely associated with the chairman in the work of the board.

He previously held the appointment of Electricity Commissioner from 1920 to 1925, and, immediately prior to his appointment under the Central Electricity Board, was Director and General Manager of the County of London Electric Supply Co. Ltd. from 1925 to 1927. He is a past President of the Institution of Electrical Engineers.

L.M.S.R. APPOINTMENTS

The following appointments have been approved by the directors:—

Chief Commercial and Chief Operating Managers' Departments

Mr. A. E. Marriott, Clerk (Research Section), Chief Commercial Manager's Office, Euston, to be Assistant District Goods and Passenger Manager, Leicester.

Mr. R. O. Banister, Stationmaster, Blackpool (Central), to be Stationmaster, Preston.

Mr. T. Lomath, Stationmaster, Southport, to be Stationmaster, Blackpool (Central).

Mr. H. Dixon, Assistant Stationmaster, Manchester (Victoria), to be Stationmaster, Southport.

Mr. A. M. Clare, Stationmaster and Yardmaster, Lostock Hall, to be Assistant Stationmaster, Manchester (Victoria).

Mr. W. Turner, Chief Accounts Clerk, District Goods Manager's Office, Warrington, to be Goods Agent, Blackpool.

Chief Operating Manager's Department
Mr. F. Sparkes, Assistant District Controller, Kentish Town, to be District Controller, Skipton.

Mr. A. W. F. Rogerson, District Locomotive Superintendent, Hasland, to be District Locomotive Superintendent, Cricklewood.

Mr. F. W. Slade, District Locomotive Superintendent, Rugby, to be District Locomotive Superintendent, Toton.

Mr. R. T. Clews, District Locomotive Superintendent, Toton, to be District Locomotive Superintendent, Rugby.

Mr. J. J. P. Sheridan, District Locomotive Superintendent, Low Moor, to be District Locomotive Superintendent, Camden.

Mr. G. H. Nelson, District Locomotive Superintendent, Patricroft, to be District Locomotive Superintendent, Accrington.

Chief Accountant's Department

Mr. H. J. Griffen, Divisional Engineering and Signal and Telegraph Accountant, Derby, to be Engineering and Signal and Telegraph Accountant (Group), Euston.

From the *London Gazette* of December 11:—Engineer and Railway Staff Corps—Major E. J. Burt, T.D., to be Lieutenant Colonel (November 17, 1934.).

Mr. Laurence Currie, J.P., late Director of the Great Western Railway, left estate valued at £250,325 (£193,649 net).

The Secretary of State for the Colonies has recently appointed Mr. M. P. Edirisinghe, Senior Assistant Accountant, to be Deputy Chief Accountant, Class II, Ceylon Government Railways.

Colonel C. F. Hitchins, D.S.O., M.I.Mech.E., M.I.N.A. of Messrs. Hitchins, Jervis & Partners, Consulting Engineers, Westminster, has joined the Board of the Partington Steel and Iron Co. Ltd.

"This plaque has been erected to the memory of C. T. Cramp, general secretary of the N.U.R., 1920-1933," is the inscription upon the plaque unveiled on December 11 by Mr. Lansbury at Unity House.

Mr. Percy Lister, who for the past ten years has been Managing Director of R. A. Lister & Co. Ltd., of Dursley, Gloucester, has been appointed Chairman of the company in succession to the late Mr. Austin Lister, who died last October. Mr. Percy Lister, who is a grandson of the late Sir Ashton Lister, the founder and until his death in 1929 the Chairman of the firm, is thirty-seven years of age. He was educated at Mill Hill and the Royal Military College, Sandhurst, and after serving with his regiment, the 18th Hussars, in France, Belgium and Germany, joined the firm nearly sixteen years ago and subsequently became Managing Director. He is also a director of several other companies, and is the Bristol and District Representative on the Executive Committee of the Federation of British Industries.

Mr. John Christopher Mitchell is, in accordance with the paragraph on page 21 of the July 7, 1933, of *THE RAILWAY GAZETTE*, retiring on December 31, upon the completion of his Secretaryship to the Liquidators of the companies in the old Underground group.

Born in Birmingham in 1867, the grandson of John Mitchell, the inventor of the steel pen, Mr. Mitchell was educated at St. Albans School, and in 1886 joined the staff of the London Road Car Company, of which he became Accountant in 1889, thereby commencing 45 years of service as a responsible officer, a record of which he is very rightly proud. He suc-



Mr. John C. Mitchell.

Secretary and Treasurer, Underground group of companies, 1921-33, and Secretary to the Liquidators of these companies, 1933-4, who is retiring at the end of the year

ceeded to the office of Secretary of the London Road Car Company in 1905, and upon the amalgamation, in 1908, of the three omnibus companies in London, he was appointed Secretary to the combined undertaking, the London General Omnibus Company. In 1921 he succeeded to the position of Secretary and Treasurer of all the companies in the Underground group, which office was abolished at June 30, 1933, on the establishment of the London Passenger Transport Board. For the past 18 months, Mr. Mitchell has been acting as Secretary to the Liquidators of the Underground group of companies. Mr. Mitchell has been a Fellow

of the Chartered Institute of Secretaries for many years and in 1916-1917 he served as President. In 1923 he was appointed a Justice of the Peace for the County of London. Mr. Mitchell is a Freeman of the City of London, being Senior Warden of the Worshipful Company of Coachmakers and Coach Harness Makers. He is a member of the Institute of Transport. He has also been Chairman, since its formation in 1923, of the Association of Superannuation and Pension Funds, with its membership of 400 funds.

From the *London Gazette*, November 27, 1934:—Regular Army Reserve of Officers: General List: Movement Control Staff (Railway and I.W.T.), 2nd Lt. B. S. Mee, having attained the age limit of liability to recall, ceases to belong to the Reserve of Officers. November 28, 1934.

INDIAN RAILWAY STAFF CHANGES

On the return from leave of Mr. J. C. Highet, Agent N.W.R., on October 7, Lt.-Col. W. Macrae, R.E., who had been officiating as Agent, reverted to his substantive appointment of Chief Engineer on that railway.

Mr. L. F. Jackson has been appointed to officiate as Senior Government Inspector of Railways, Circle No. 5, Bombay, as from October 28, with the rank of Chief Engineer, State Railways. Rai Bahadur P. L. Dhawan, whom he succeeded, has reverted to his substantive appointment as Deputy Chief Engineer, N.W.R., as from the same date.

Mr. E. B. Robey, Chief Engineer, Indian State Railways, has been posted as Senior Government Inspector of Railways, Circle No. 1, Calcutta, as from October 26. He succeeded Mr. H. A. Joscelyne, who reverted to his substantive appointment of Deputy Chief Engineer, E.B.R., on that date.

Mr. N. D. Calder, has been appointed to officiate as Traffic Manager, E.B.R., as from October 20. Mr. L. W. Vansomer, whom he succeeded, has reverted to his substantive appointment of Deputy Traffic Manager on that railway as from that date.

Mr. R. A. Leakey, on return from leave, has assumed charge as Superintendent Rates and Development in the Commercial Department of the B.N.R., as from October 31.

Mr. D. C. Campbell, on return from leave has been posted as Director, Railway Clearing Accounts Office, as from October 22. Also Mr. F. W. Wilby, on return from leave, has been posted as additional Deputy Director of that office from the same date.

Mr. E. J. H. Lemon on the Future of Railways

Speaking on this subject at a meeting of the Railway Students' Association, held at the London School of Economics, on December 6, (under the chairmanship of Mr. C. E. R. Sherrington, M.C., M.A., Secretary, Railway Research Service), Mr. E. J. H. Lemon, Vice President, Traffic Operating and Commercial Section, L.M.S.R., said that the railways had emerged from the monopolistic period of their existence into that of a very highly competitive one; the selling organisations of all railways had to be overhauled, revitalised and extended. It was easier to manufacture an article than it was to sell it. It was the recognition of this fact by the L.M.S.R. that caused them to separate the functions of the so-called traffic departments of the railway into clear-cut "commercial" and "operating," and to appoint a Chief Commercial Manager whose prime objective was to sell, and a Chief Operating Manager whose function was to provide services that the Chief Commercial Manager could sell and get repeat orders for. Salesmanship would play a greater and greater part in the railway business of the future, and he thought we should not be above learning from our competitors what they had to teach us about this important question. Salesmanship had to include the definite ideal of service to the customer, and your salesman must have made available to him information which would be of use to his customers, such, for example, as possible and potential markets. The customers of the railway must be provided with such service through the salesmen that they might come to look on the salesmen not as nuisances, but as sources of advice and information.

Commercial Research

The railway organisation was so widespread and touched the business life of the country at practically all points that a systematic collection of the information available and its utilisation by the salesmen might be of great interest to other customers of the railway. There, he thought, was where the commercial side of the railway undertaking could take a leaf out of the book of their technical brothers and apply methods of scientific research to analyse the commercial problems. With this end in view, the L.M.S.R. had built up a commercial research service where all such problems were handed over to men who had been specially selected, and devoted the whole of their time to scientific research.

It was sometimes said that no amount of salesmanship could increase the amount of business that was being done on the freight side of the railway; there was only a given amount of transport required for the volume of

the business that was being carried on by the country. It was possible to get such traffic to move through longer distances providing a satisfactory service could be given; this was where it was necessary to have co-operation between the customer and the railways. Two instances came to his mind: one was that of the transport of green peas in the season from Yorkshire to London, where a considerable volume of business was developed by transporting the peas to London, due to the fact that a suitable service had been provided. Similarly, London was being supplied with milk from the south of Scotland which previously was not available, due to co-operation between the dairy companies in providing tanks to carry the milk in bulk and the railway company in providing a fast service.

Quotas to Encourage Enterprise

It was never to be forgotten that a railway did not thrive upon the labours of its headquarters' staff only—useful and necessary as executive and administrative staffs were—but through the work of the "men on the spot." The stationmaster or agent, the booking clerk and the town canvasser were the men in touch with the public business, and their interest or lack of interest might have a considerable effect on revenue position. The L.M.S. commercial officers had adopted, therefore, a quota system or a budgeting of receipts. Each station at the beginning of the year was given a figure of receipts which it was expected would be obtained, and the results for all stations were tabulated and circulated monthly to keep up the competitive spirit. District totals were also compiled for comparative purposes.

In the future, railways, Mr. Lemon thought, would have gradually to develop higher average speeds without, of course, in any way endangering their present safety record. The reason that he had mentioned the development of a higher average speed throughout was that, when a crack train was put on, and the line had to be cleared in order that it might get its path at the higher speeds, it reduced the capacity of the line for the carrying on of the normal business of the company. It was an axiom, of course, that the more nearly all trains approach a uniform speed, the higher was the capacity of the line at such speed. In spite of the extra cost, the railways would have to endeavour to meet the demand for speed, because it was something that had a selling value. It was important to carry on researches into methods that would give lighter stock that might be hauled at a higher speed by the existing steam locomotive without unduly increasing coal consumption.

One of the biggest items in railway expenditure was that connected

with the running of the locomotive. On the L.M.S.R. approximately 30 millions of capital was tied up in locomotives, and in order to see exactly what was happening so far as the use was concerned, they had a motion study made of all the locomotives at six sheds for a week. There was a certain amount of waste time. Locomotives on British railways, on an average, worked 12 hours a day, or on two hours work at 56 m.p.h. they ran 112 miles a day. There was a certain amount of delay arising in running sheds, due to the layout of the yards having just grown up over the 100 years of railway history, and a certain amount of time was lost from the moment an engine came off a train until it had been coaled, watered, sanded, inspected and repaired ready for service again. This had been attacked, so far as the L.M.S.R. was concerned, by altering the layout of the yards so that the minimum time would be taken in these operations.

Looked at from one point of view, much of the shunting carried out by a railway company might be regarded as waste or, in any case, an addition to the actual cost of hauling, which was really the earning capacity of the line. It was, therefore, very necessary that there should be a very close analysis to see that the least number of wagon movements possible was made, to see that shunting engines were fully employed throughout the whole of their shift, and more important still to find and utilise a cheaper unit for such shunting work of the railway. Here, he thought, was a field for the application of diesel units.

One of the disabilities that the railway laboured under, and which had to be attacked energetically, was terminal costs. On the L.M.S.R. system the hours per ton at goods sheds varied from 0.8 to 2.5. Some interesting information was now available as to the cause of these wide variations, and he might say that differing traffics in towns of the same size would not be accepted by him as admitting of any more variation in cost than, say, roughly 5 per cent. In investigations of this nature it might be that the film could be used for finding out defects and applying remedies. A fine photograph could be taken of a big goods station with wide and long platforms, equipped with electric trucks, mobile cranes, &c., yet it would be found on investigation that sometimes these mechanical aids were a delusion and a snare. The first principles of efficiency were:—

- (1) Eliminate trucking as much as possible.
- (2) Move your goods through the shortest possible distances, i.e., from wagon to dray.
- (3) Bring the work to the men, and not take the men to the work, thus removing walking time of the men and the horses, and also assist supervision.
- (4) Make the work as easy as possible for the men, in order to reduce the physical effort involved.
- (5) Improve the conditions in the shed and yard by better lighting and condition of deck surfaces, &c.
- (6) In other words, arrange for the work to be done under the best possible conditions.

The New Maritime Station at Cherbourg

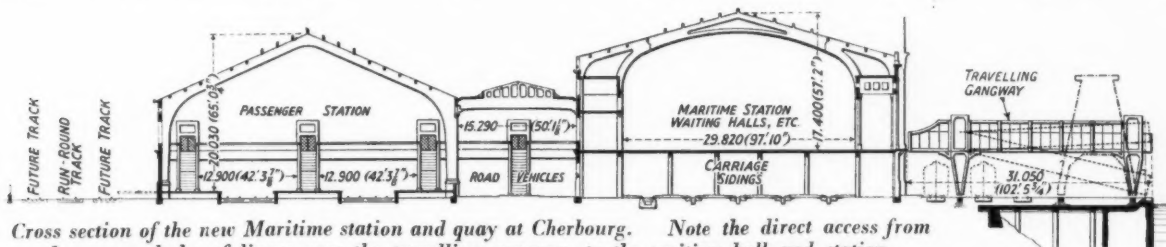
(See drawings opposite and illustrations on page 980)

Until 1932 liners calling at Cherbourg were unable to come alongside the quay on which the railway station was situated, and passengers

the trains are prepared before running into the platforms.

Nine movable gangways, running on rails parallel with the quayside, com-

ment, moreover, allows the gangways to be swung into a vertical position, so leaving a free passage for the cranes running on special tracks at the edge of the quay. These cranes transfer heavy luggage and goods direct between the holds of the vessels and the wagons in the adjacent sidings.



Cross section of the new Maritime station and quay at Cherbourg. Note the direct access from the upper decks of liners over the travelling gangway to the waiting hall and station

had to be conveyed to and from the roadstead by tender. Works were therefore taken in hand, in 1924, which culminated on July 30, 1933, in the inauguration of a new Maritime station and two deep-water ocean liner quays, allowing vessels to effect direct connection with the trains.

Advantage has been taken of the position of the new station to build approach lines which by-pass the former route through the streets of the town, imposing a speed restriction of 5 m.p.h. This handicap was all the more serious in that it led directly to the foot of a long and severe up gradient, on the Cherbourg-Paris main line, the ascent of which was consequently started at a walking pace. Under the new arrangement, trains have sufficient distance to attain a speed of about 40 m.p.h. before starting the climb to the summit. Boat expresses between Paris and Cherbourg have been accelerated in consequence.

The diagrams herewith show the direct access afforded between the trains and the liners, and it will be noticed that the situation of the road vehicle terminus, which is directly served by the *route nationale* from Paris to Cherbourg, allows passengers by car and coach to share equal facilities with patrons of the railway. The station building itself receives the trains, at ground level, in four platform lines. The exit to the quay is by three wide overbridges, reached by stairways. The spacious and handsome building housing the waiting hall, customs, railway and other offices is surmounted by a clock tower which is a landmark fifteen miles out at sea. The passenger waiting hall, on the first floor, is well-lit, airy and decorated with simple harmony. The interior panels give scope for mural paintings if desired. Seats and tables, telegraph and exchange offices are provided. Grouped around the circulating area are a buffet-bar, shops and travel inquiry offices. Special accommodation is provided for the reception of visitors of note. On the ground floor of this building are the sidings where

municate with the liners. Each has two passageways, one for passengers and the other, fitted with a belt conveyor floor, for light luggage. In addition to their lateral movement, the gangways are pivoted horizontally at the landward end and so can be adjusted to any deck level. All classes of passengers can thus be transferred at the same time. The same arrange-

The exterior design of the station and its associated buildings reflects the dignity and restraint of the interior decoration. Construction throughout is of reinforced concrete. The reinforced concrete work was carried out by Christiani and Nielsen, and will certainly justify its use by reducing the maintenance of these important edifices to negligible proportions.

Los Angeles-New York in 57 Hours

Further details are now to hand of the run made in October last from Los Angeles, Cal., to New York by the six-car high-speed streamlined train of the Union Pacific Railroad. Leaving Los Angeles at 10 p.m. on October 22, the train reached the Grand Central terminal at New York at 9.55 a.m. on October 25. Allowing for three changes of time *en route*, in each case of one hour, the total transit time for the journey of 3,260 miles was thus 56 hr. 55 min., and the average speed 57.3 m.p.h. This time included several lengthy stops, however, such as 23 min. at Salt Lake City, 38 min. at Omaha and 40 min. at Chicago, so that the average running speed across North America was but little, if anything, short of 60 m.p.h. throughout. Further, for traffic reasons no higher speed was permitted over the New York Central lines than that of the Twentieth Century Limited express from Chicago to New York, to which the speed of the train was reduced to conform, so that this distance of 961 miles occupied 17 hr. 25 min., with an average speed of 55.2 m.p.h.; it also included working the train with an electric locomotive from Harman through the tunnels under the Hudson into New York.

But the 488 miles over the tracks of the Chicago & North Western Railroad from Omaha to Chicago were run in 8 hr. 5 min., at an average of 60.4 m.p.h., and the 507 miles between Cheyenne and Omaha in 6 hr. 11 min., at the much higher average of 82.0 m.p.h. It was on the last-mentioned length that a maximum speed of 120

m.p.h. was claimed, but this turns out to be a purely approximate statement that a distance of two miles was covered in 1 min., and cannot be accepted as authentic. West of Cheyenne, the 520 miles between Salt Lake City and Cheyenne were covered in 8 hr. 46 min., at an average of 59.3 m.p.h.; and one of the most meritorious achievements of all, probably, was the time of 14 hr. 37 min. for the 784 miles from Los Angeles through the mountain ranges of the western seaboard to Salt Lake City, involving an average of 53.6 m.p.h. over this difficult portion of the route.

Previously the fastest time ever recorded from coast to coast was 71 hr. 27 min., in May, 1906, achieved by a special run for Mr. E. H. Harriman from Oakland, Cal., to New York, and in 1905 a special train of the Atchison, Topeka & Santa Fe Railroad was worked from Los Angeles to Chicago in 44 hr. 53 min.; on the journey now under review these times were lowered by 14 hr. 32 min. and 6 hr. 6 min. respectively, the time made from Los Angeles to Chicago being 38 hr. 47 min. for the 2,299 miles. The schedule proposed for the high-speed service, when finally established, is variously mentioned as 39 hr. and 40 hr.; if the latter, it will reduce the 58½ hr. of the best existing service, and will bring New York within less than 60 hr. of the Pacific coast by means of the connecting trains of the New York Central and Pennsylvania companies. For these details we are indebted to our American contemporary, the *Railway Age*.

The Evolution of Railway Vehicle Suspension*

A most interesting and valuable paper on the evolution of railway vehicle suspension was presented in London recently by Mr. T. H. Sanders, an acknowledged expert on the subject of spring suspension. The paper covered the history of springing as applied to railway locomotives and rolling stock from the earliest times, and after passing in review the whole subject in this country and abroad, concluded with a reference to the latest types of high speed vehicles and trains, and the methods of springing therewith employed. In dealing with the historical part of his subject, the author remarked that the rush of locomotive design and building which followed on the success of *Rocket* produced in all cases examples of the spring-borne engine. Some notable instances of the period included the rebuilding of the Stockton and Darlington *Royal George* engine with inverted equalising springs between the two leading axles, the trailing, or driving axle remaining solid, owing to the vertical cylinder machinery. It should be mentioned that these leading axles were originally connected to a solid pivoted bar on each side, which was the first equalising lever. The Dundee and Newtyle engine of 1833 had a bogie with overhung springs. The Neath Abbey Works engines, of the Rhymer Iron Company built in 1838, were articulated, the weight being carried to each truck by inverted equaliser springs, the engines running with plain tyres on plate-ways. The G.W.R. "Centaur" class of 1840, 2-2-2 with six-wheeled tenders, used elliptic springs for ten axleboxes out of twelve, an arrangement first introduced by Stephenson in 1832, and which survived only a few years, to be revived in modern times by the former L. & Y.R.

Coiled and Volute Springs

The first trace that can be found of coiled springs is their use on buffing and drawgear on the Birmingham and Gloucester Railway in 1844, and in 1847 as trailing bearing springs on a Sharp & Company's engine for the Manchester & Birmingham Railway. They were evidently employed here owing to the juxtaposition of the fire-box to the desired position of the bearing springs. About this period, the use of the laminated spring was intended to receive a severe check by the invention of the volute spring. The use of rubber at about this time also seriously threatened the use of the laminated spring. The process of vulcanisation of the raw rubber, which is the key to its satisfactory use, was discovered in the U.S.A. in 1839, and

the art was introduced into this country about 1842. By 1850 it was in use for main locomotive bearing springs, and at least two classes of famous engines of the day were entirely borne upon rubber, namely, the Bristol and Exeter 9 ft. 0 in. single tank engines, and McConnell's large single express engines (succeeding the "Bloomers") which ran on the Southern Division of the then L.N.W.R. Later, however, rubber for the main springs was abandoned, but its use for subsidiary purposes was very extensive, as was particularly instanced by the N.L.R. 4-4-0 tank engines of a few years later. In Germany, owing presumably to the less advanced state of the metallurgical arts, wooden springs were used fairly widely in wagon construction, and examples still exist in the railway museums of Berlin and Nuremberg.

Some extremely interesting spring designs appeared in the railway practice of the fifties, notably variants on the open-leaf scheme of the G.W.R. engines referred to earlier, the use of various types of adjusting gear, and the provision of copper or iron back plates, owing to the spring-making technique of the period being deficient in the art of producing the "solid eye" for taking the hanger pins. Modern practice has provided detail refinements in spring construction, and the improvement of material has led to the production of a very reliable article—if properly designed, made of good steel, and correctly heat-treated.

Spring Equalising Systems

In locomotive design the equalisation, or compensation, of the suspension springs is a matter of considerable importance. The three-point arrangement is the only scheme which is absolutely stable under all conditions, and U.S.A. practice adheres to this as an article of faith. A very usual modern type of express engine is represented by the 4-6-2 or Pacific class, which is used in most countries, and at least five different methods exist of arranging the suspension for this class. In England, with its high class permanent way, the L.N.E.R. Pacifics travel on nine points, whereas on the P.L.M. (France), with track almost as good, they travel on four points. The German railways have a four-point arrangement, but differing from the French, and somewhat less liable to roll, whilst the Belgian railways have a five-point compromise on the two foregoing. The U.S.A. Pacifics have, of course, three points, and the engine rolls easily—a characteristic rather necessary in view of the staggered joint permanent way which is the usual practice over there.

The need for some form of equalising on modern locomotives working over

other than first class tracks should be fairly obvious when it is remembered that high speeds have to be maintained not only over the unbroken track, but over the various breaks which occur, due to cross-overs, junctions and slip-roads. Additionally, on railways with numerous sharp curves, necessitating substantial super-elevation, unless good equalisation is present the engine can easily derail, owing to the differences of level of the track, as it rides up a sloping rail until the required height of the outer rail of the curve is reached.

Carriage and Wagon Springing

Wagon stock submits no special problems of suspension, the main point being to provide springs which will keep the vehicle within the range of permitted buffer or coupler heights whether it be light or loaded, whilst at the same time keeping the springs sufficiently flexible to hold the wagon on indifferent track when it is light. Passenger rolling stock has, however, to receive very great attention from the designer. Owing to the ratio of tare weight to pay load being high in a passenger coach (whereas it is relatively low in a wagon), springs of high deflection can be used, and 8 in. deflection is not uncommon. When, however, bogie stock is used, as is now universal for express traffic, there is no limit to the possible ingenuity of design. The provision of rubber cushions in spring gear and underframes is also receiving considerable attention at present, especially in view of the present surplus of rubber and its relatively low price.

The attempt to provide a spring wheel as an additional aid to riding comfort dates back many decades, and at least one pattern actually existed, namely that invented by Adams, in 1863, and fitted to wheels on a tank engine of the St. Helens Railway. The actual deflection of the rim in this case was obviously not great, and it is clearly a most difficult thing to provide a spring wheel if tyre brake blocks are fitted. Consequently, for railway service the spring wheel has remained a matter of history, whilst the road vehicle has been fitted with wheels of continually increasing springiness. With the continual demand, however, for noise reduction and increased comfort, further attention has been given by the railway material manufacturers to the provision of some form of wheel with rubber inserts, and numerous types now actually exist.

High Speed Traction and Springing

The latest phase of rail traction in which pneumatic tyres are used is one of considerable interest. For years passenger coaches have steadily increased in weight, as more passenger space has been allowed, and more luxury fittings introduced, until examples can be found in the U.S.A. of cars in ordinary service weighing 2.5 tons a seat. In Europe, the Rheingold luxury coaches

* Abstract of a paper read by Mr. T. H. Sanders before the Institution of Locomotive Engineers.

weigh 55 tons, and a Mitropa restaurant car scales 53 tons, which is also the weight of the latest third class Belgian stock. Now has come a reaction towards light-weight high-speed stock, so that the Michelin railcar is found to weigh 0.20 tons a seat, and the Bugatti only 0.04 tons a seat—these weights including the traction equipment. A comparative basis of a normal European express, inclusive of locomotive, gives a weight of about 2.20 tons a seat, eleven times as much as

that of the Michelin, and nearly six times as much as that of the Bugatti, which has engine power for a service speed of 100 m.p.h.

In consequence of this recent revolution, the whole matter of suspension has been revised. The weight of all bogie members has to be cut to a minimum, and in consequence the Michelin type dispenses with orthodox railway construction and fastens its springs direct to the wheel bearings, the springs locating the axles, as in road

automobile practice. The Bugatti car, with its four axles on each bogie, fastens the wheels in two groups, with springs arranged similarly to those of the Gibbins truck of the Gloucester Carriage & Wagon Co. Ltd. Both types of car have the wheels as an intermediate resilient link, and both are replete with rubber cushions between bogie and body. The only thing now needed to complete this last phase is that these vehicles should run on spring-supported tracks.

The Cost of Speed

In the course of his speech at the Warrington Chamber of Commerce annual dinner, on Monday, Sir Josiah Stamp, Chairman of the L.M.S.R., said that tremendous interest was taken today in questions of speed, whether by sea, in the air, or on the land, and we were prepared to go to great lengths to secure the advantages that it possessed. In all directions there was the greatest concentration of scientific and engineering ability to secure technical perfection and advance in this way. He was bound to confess, however, that he was more concerned in the economics of speed, and refused to be excited by any additional acceleration until he knew the relative cost of obtaining it and what sacrifices there might be of other amenities of comfort and of safety.

So far as the air was concerned, the recent race to Australia had concentrated public attention on the question of speed, but increased speed involved engines of greater horse power, increased fuel consumption, and lower paying load, and in the case of some of the aircraft now operated by Railway Air Services, an increase of 20 per cent. of speed would involve an all-in increase of at least 40 per cent. in operating costs. When we came to the sea, similar factors applied, and if we wished to accelerate the speed of one of our latest vessels by 20 per cent., the cost of fuel alone would be increased 100 per cent.

On the road we now had such easily compassable high speeds for the hundreds of thousands of individual drivers, on the same thoroughfare that is required for the humble pedestrian, cyclist, for the flock of sheep going to market, and also the only access to school for thousands of children, that the cost of speed here was not so much a monetary one as a social one, and had raised one of the acutest problems coming under the general head of liberty in the modern state.

When we came to the railways, we could consider the general average speed for all-round convenience, or special speed for special trains. The latter might be of great spectacular interest, and also some individual convenience, but on lines that were

already densely occupied, they might be run at the cost of the convenience of the remainder. The cost of speed in train travel was a matter to which he had been giving the closest attention. In the past two or three years the L.M.S.R. had specialised in raising the general average express speed over the line, and he had listed thirty trains with an average speed of over 58 m.p.h., eight of them running 60 m.p.h. or more, regularly. These eight represented a total daily run of practically a thousand miles and, insofar as they had corresponding predecessors in 1914, there was an average increase in the speed of 10.2 per cent. The leader running at 64.4 m.p.h. was 17 per cent. better than formerly.

The general policy of the L.M.S.R. during the last two years had been one of continued acceleration of passenger services, and also to a very marked extent of freight services, where performances in past years had been completely outdistanced. When comparison was being made with certain passenger trains before the war, people often lost sight of the considerable extra train weight per passenger now customary, when all the amenities of corridors, lavatories, dining cars, and the additional cost of lighting and heating made all such comparisons rather artificial. What had been the cost of this acceleration so far? He was glad to say that any mathematical addition that might have been predicted had been, to a great extent, offset by more economical coal consumption per mile, and various operating economies.

The question of still higher speeds was having his constant attention, and some time ago his officers started a series of special tests designed to answer questions as to the relation between speed, weight and cost—three variables that in a business like that of the L.M.S.R., where the margins (with the greatly reduced fares) were now so fine, had to be weighed carefully. These tests had to be sufficiently numerous and tried under sufficiently different conditions to yield principles capable of general application. They consisted in the main in running trains over long stretches of line at different increased speeds with

varying weights of train, with the object of determining the increased cost resulting from the increments of increased speeds. These results, combined with the knowledge gained from the remarkable and interesting L.N.E.R. experiment a few days ago, ought to teach a great deal, not so much about maximum speeds obtainable, as the added cost per increment of speed.

As a good deal of public interest was being shown at the present moment in speeds, and for an interesting illustration of these tests, Sir Josiah remarked that on September 19 and 20, 1933, a series of special high-speed journeys were made between Euston and Coventry and *vice versa*. The fastest of these journeys attempted was made on September 19 by the "Royal Scot" class engine No. 6129 *Comet*, which, with a train of seven coaches (202 tons) ran the 93½ miles from Coventry to a signal stop at Euston No. 4 signal box in 74 min. 20 sec., at an average speed of 75 m.p.h. The maximum speed attained on this journey was 92 m.p.h. and a speed of 90 m.p.h. was attained or exceeded at three other points on the journey. The 70½ miles from Welton to Willesden Junction were covered in under 50 min. at an average speed of 84 m.p.h. In the course of these tests the engine *Comet* on two successive days with an average load of 273 tons covered a total of 235 miles at an average speed of 79 m.p.h.

Again, dealing with still heavier loads, on April 6, 1934, the 4-6-2 locomotive No. 6200 *The Princess Royal*, with the 5.25 p.m. ordinary express train from Liverpool to Euston (12 vehicles, 354 tons) covered the 152.7 miles from Crewe to Willesden Junction start-to-stop in 134 min. 35 sec., at an average speed of 68 m.p.h. A maximum speed of 85 m.p.h. was recorded at two points.

The comparison of results with the costs of increments in speed obtained from diesels, &c., would give in due course the basis of much important planning for the future. The practical economic problem of running a fast train, however, went much further than the costs of the physical performance, and involve commercial considerations such as the traffic affected, or deflected from other trains, with sometimes surprising repercussions.

Trade and the Railway Services

In the course of an address to the Birmingham Rotary Club on Monday last, Mr. Ashton Davies, Chief Commercial Manager, L.M.S.R., said that we in this country were blessed with a unique availability of transport which had reached not merely a state of adequacy, but had of a certainty passed the point of superfluity. One of the great problems of the day was how we might best use those transport facilities, and at the same time know of a surety that we were using them economically, and in a way which ultimately would produce the greatest measure of national wealth.

In 1913 the British railways conveyed 364 million tons of freight—that is to say, 364 million tons of the raw materials and products of our industries, imports of foodstuffs and the other necessities of our existence. Twenty years after a remarkable shrinkage had occurred. In 1933 the British railways carried the reduced, but still enormous, traffic of 251 million tons—a diminution of no less than 113 million tons compared with 1913, of which 61 million tons was coal. These figures did not draw the picture at its worst, because 1932 tonnage was still lower by 1½ million than in 1933. 1932 was undoubtedly the blackest year in the history of this country and of the railways, and, as yet, the factors which were responsible for creating the situation had been removed only in part.

Almost certainly some industries in this country, notably cotton and coal, would never again achieve their one-time unique position as competitors in world markets. We were 78 million tons down in output of coal. Where we raised 100 tons of coal in 1913, we only raised 72 tons in 1932; where we shipped 100 tons in 1913, this had shrunk to 56 tons in 1932. In 1913 the production of pig iron and steel ingots was equal to 18 million tons, in 1929 it was 17 million tons, but in 1932 it had fallen to 9 million, or barely more than a half of the 1929 figures. Fortunately, the iron and steel trade had shared to some extent in the improved position which has set in since the middle of 1933; the production figures for the current year up to September compared with the same periods of 1929, 1932, and 1933 expressed as indices revealed the following position:—

1929	= 100
1932	= 51
1933	= 62
1934	= 85

It was not until the earlier months of 1933 that any ray of light appeared on our trade horizon, and it was some months later that the downward curve of our traffic graphs exhibited a distinct tendency to become an upward curve, which he was glad to say was still continuing to manifest itself. In these circumstances the railways had a

three-fold responsibility. First, at all times to produce efficient transport services and facilities adequate for the public need, and almost irrespective of any adverse influences which might tend to make difficult of achievement the provision and development of those essential services; secondly, a responsibility as trustees of the special interests of railway stockholders. In times of depression and decline, not only must the strictest economy in expenditure be exercised, but the mobile part of the establishment (whether in staff or plant) must be reduced as far as possible to avoid redundancy; and thirdly, not to be content merely to provide services for passengers or goods which inevitably present themselves for transport; but to be on the alert at all times to create new traffic over our railways, because that overplus of created business was usually so much mere net profit to the railway undertakings.

Turning for a moment to the actual improvement which had occurred during the past fifteen months. Mr. Ashton Davies said that so far as the L.M.S.R. was concerned, the current improvement in trade over last year's position, as measured by carryings, was better in the Midlands than in any other part of the country. He also referred to a rather striking feature in an article on the country's trade which appeared a few months ago in the *Sunday Observer*, in which the writer quoted figures to show that the number of insured workers actually in employ-

ment in this country in the first quarter of the year was within 1 per cent. of the 1929 level; and production (according to the Board of Trade index) was also within 2 per cent. of 1929 production. As the commercial administrator of the largest railway undertaking in this country, with earnings down by 18 per cent. compared with 1929, he asked himself, could we really be as prosperous as a nation as those figures seem to suggest, and, if the answer was an affirmative, was he failing in his job, because he was not earning 1929 receipts by some 18 per cent.?

Close investigation of the situation disclosed that, compared with 1929, there was actually a decrease of 450,000 or 7 per cent. in the numbers of insured workers in the heavy and staple trades, such as coal mining, iron and steel, engineering, shipbuilding, and textiles; and that this decline in the workers in the heavy and staple industries was almost counterbalanced by increased employment in a diversity of general trades and business such as the distributive trades, transport, hotels, and the luxury trades. Naturally the loss of production in the heavy trades affects the railways most adversely, because it was those industries from which spring the enormous masses of freight which in normal times required to be moved by rail, and for which rail was the only practicable medium for its movement.

The operating ratio of the railways was in the region of 82 per cent., and had been computed by reliable authorities that something like 60 per cent. of expenditure was of the constant or non-variable type.

Forthcoming Events

- Dec. 14 (*Fri.*).—Institute of Transport (Leeds Graduate), at Leeds Church Inst., Albion Place, 7 p.m. "Recent Developments in Short Distance Passenger Transport," by Mr. F. B. Harrison.
Institute of Transport (Newcastle), at Royal Station Hotel, 7.30 p.m. "Education for the Road Passenger Transport Industry," by Mr. E. R. L. Fitzpayne.
Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 6 p.m. "Air Swirl in Oil Engines," by Mr. J. F. Alcock.
Dec. 14-15.—Wimbledon and District Model Railway Club, Alt Grove, St. George's Road, London, S.W.19. Annual Exhibition.
Dec. 15 (*Sat.*).—L.N.E.R. Musical Society, at Queen's Hall, Langham Place, London, W.1, 8 p.m. Carol Concert.
Permanent Way Institution (Manchester-Liverpool), at Victoria Station, Manchester, 3 p.m. Election of Officers, 1935.
Dec. 17 (*Mon.*).—Institute of Transport (Scottish), at Royal British Hotel, Princes Street, Edinburgh, 7.15 p.m. "The Law and Transport," by Mr. J. W. London.
Institution of Mechanical Engineers (Graduate), Storey's Gate, London, S.W.1, 6.45 p.m. "The Overhaul of Electric Railway Stock," by Mr. E. G. McEwen.
Institution of Welding Engineers (Middlebrough), at Cleveland Scientific and Technical Inst., Corporation Road, 7.30 p.m. "Fabrication of Highly-Stressed Mobile Railway Structures," by Mr. J. A. S. Thom.
Dec. 18 (*Tues.*).—Industrial Transport Association, at British Iron and Steel Federation, Caxton House (East), Tothill Street,

London, S.W.1, 6.30 p.m. "An Ideal Transport Department," Short Papers by Miss N. Sutherland, and Messrs. Warwick, Buchanan and Rowntree.

Institute of Transport (London), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. "Time Tables in Theory and Practice," by Mr. W. E. Green.

Institution of Welding Engineers (Newcastle), at Inst. of Mining and Mechanical Engineers, Neville Hall, Westgate Road, 7.15 p.m. "Fabrication of Highly-Stressed Mobile Railway Structures," by Mr. J. A. S. Thom.

Permanent-Way Institution (Scottish), at Royal Technical College, George Street, Glasgow, 7.15 p.m. "Permanent-Way Relaying Costs," by Mr. D. Boyd.

Dec. 19 (*Wed.*).—British Science Guild, at Royal Society of Arts, John Street, Adelphi, London, W.C.2, 5 p.m. "Bringing Science into the Road-Traffic Problem," by Col. Mervyn O'Gorman, C.B.

Diesel Engine Users' Association, at Caxton Hall, Caxton Street, London, S.W.1, 3 p.m. "The Development and Progress of the High-Speed Diesel Engine in Road Transport," by Major W. H. Goddard.

Institution of Locomotive Engineers (Birmingham), at Queen's Hotel, 6.45 p.m. "The Progressive System of Workshop Training, The Embryo Locomotive Engineer," by Mr. E. J. Larkin.

Dec. 20 (*Thurs.*).—Institution of Production Engineers (Glasgow), at Inst. of Engineers and Shipbuilders, 7.30 p.m. "Some Modern Developments in Press and Press Tool Design," by Mr. N. C. Wilson.

Wimbledon and District Model Railway Club, at Rose and Crown Hotel, High Street, 8 p.m. Informal Dinner.

RAILWAY AND OTHER MEETINGS

MEXICAN RAILWAY CO. LTD.

The 139th ordinary general meeting of the Mexican Railway Co. Ltd., for the half year ended June 30 last, was held at Winchester House, Old Broad Street, E.C.4, on December 12, Mr. Vincent W. Yorke (Chairman) presiding.

The Secretary (Mr. C. Tennant) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that his forecast of recovering prosperity in Mexico, made at the half yearly meeting six months earlier, had been fully realised. The rising price of silver had stimulated the mining industry, and the balance of trade for the first six months of 1934 was very favourable, exports in that period having nearly doubled imports. A powerful factor in the revival of commerce had been the pegging of the exchange at 3.60 pesos to the American dollar, which had been effective throughout the year. Cotton factories in the district of Orizaba, served by the company, were working more than full time, and other industries were fully employed. Tourist traffic from America had been greatly encouraged by the stabilisation of the exchange and the political quiet of the country.

Against these material assets to the company's business there had to be set the fact that, although the rate of exchange encouraged trade, it had cut down the rate of remittances by nearly one half—from 2s. to the peso to about 1s. 1d. Labour troubles had also been severe, and in face of these difficulties it was impossible to work the railway efficiently and economically.

Passenger receipts for the last half year had increased by 16 per cent. compared with the first half of 1933, and this was almost entirely due to the tourist traffic. The increase continued into the current half year, but had suffered a setback since the disaster to the *Morro Castle*, the owners of which worked in close connection with the railway and gave an excellent service from New York to Vera Cruz. There was no doubt, however, that the American tourist traffic would revive given peaceful conditions in Mexico. Its possibilities were unbounded, and the opening of several modern hotels in Mexico City would help to promote it.

The satisfactory increase of about 30 per cent. in goods traffic was spread over all classes of merchandise. Fuel oil and refined petroleum showed the greatest advance, since although the Mexican Eagle Oil Company had installed a pipe line to Mexico City, a competing company was sending its traffic by rail. Products refined from crude oil in Mexico City also constituted a valuable traffic, which should

mitigate the effect of the further installation of pipe lines.

Expenses had increased by only 12.9 per cent. in spite of the 26 per cent. rise in total receipts and a heavy fall in exchange, the latter having chiefly affected the cost of electric power and fuel oil. The net revenue of \$757,000 compared very favourably with the corresponding half year, but exchange depreciation had reduced the earnings to £42,000, or a little more than half what was required to cover the debenture interest. Even so, the figures were better than any recorded since the first half of 1930. A profit of about \$400,000 might be expected for the current half year.

The election of the new President, General Cardenas, had passed off very peaceably. So far he had not declared

his policy, but it should be remembered that his term of office coincided with the strongly nationalistic Six Years Plan. Labour troubles had accompanied the revival of industry and had resulted in insistent demands for a 42-hr. week, payment for Sundays when no time had been worked and the formation of a Labour Committee to sanction all expenditure. The commission of officers and men which had previously arbitrated in labour problems had been terminated by the men without notice. The company, however, had resisted these demands even in face of strike threats.

The financial position continued to improve, but additional expenditure on freight vehicles would be necessary to meet with the new traffic. Passenger stock could cope with present requirements, but would have to be augmented if the demand increased.

The report and accounts were unanimously adopted.

RAILWAY AND OTHER REPORTS

Rohilkund & Kumaon Railway.—

The board, at its meeting on December 6, recommended a final dividend for the year ended September 30, 1934, of 6 per cent., together with a bonus of 4 per cent. on the company's ordinary stock, making with the ad-interim dividend and bonus of 6 per cent. paid in July, 1934, a total payment of 16 per cent. per annum. The dividend and bonus will be paid, less income tax, at 2s. 6d. in the £, on January 28, 1935.

Assam Bengal Railway.—

Gross receipts for the year to March 31, 1934, amounted to Rs. 1,73,11,354, against Rs. 1,69,18,042, and working expenses to Rs. 1,29,50,471 compared with Rs. 1,21,21,511 in the previous year, with the result that the operating ratio has risen from 71.65 to 74.81 per cent. The balance in England on account of the company's surplus profits is £1,816. Adding sundry Indian income-tax adjustments and interest on deposit, &c., makes a total of £1,858, which it is proposed to carry forward.

Bengal & North Western Railway.—

The board, at its meeting on December 6, after appropriating half-year's interest on reserves, amounting to approximately £46,000, recommended a final dividend for the year ended September 30, 1934, of 7 per cent. together with a bonus of 1 per cent. on the company's ordinary stock, making, with the ad-interim dividend and bonus of 8 per cent. paid in July, 1934, a total of 16 per cent. per annum. The dividend and bonus will be paid, less income tax, at 2s. 6d. in the £, on February 4, 1935.

Associated Equipment Co. Ltd.—

Accounts for the year ended September 30 show a net profit, after transferring £40,000 (against £32,000) to income-tax reserve, of £102,007 (against £62,384 for

the previous nine months, when a profit of £7,576 on the sale and redemption of investments was included). A final dividend of 5½ per cent., less tax, is to be paid on the capital of £1,500,000, making a total distribution of 8½ per cent., and £233,984 is to be carried forward (against £225,727). The dividend for the previous period was 5 per cent.

British Automatic Co. Ltd.—

The accounts for the year to September 30, 1934, show a profit, after charging £20,000 debenture interest, of £24,261, and the balance of profit brought forward from 1933 was £5,266, making a total of £29,527 available. The directors have allocated £10,800 to depreciation and renewals account and £10,715 to contingency reserve, leaving a balance of £8,011 to be carried forward. Throughout the financial year the takings of the company's machines showed a steady increase.

John I. Thornycroft & Co. Ltd.—

After providing for depreciation and bad and doubtful debts there was a trading loss of £51,110 for the year ended July 31. This loss, which compares with £84,940 for 1932-33, is increased by debenture interest, &c., to a total loss of £66,980. A transfer of £66,000 is made from general reserve. Compared with the previous year, motor vehicle sales increased by 64 per cent. and marine motor and motor-boat sales by 73 per cent., the increase being divided almost equally between the home and overseas markets. Reductions have been effected in establishment charges and the management of the motor vehicle side of the business has been reorganised. Losses have been reduced substantially compared with the preceding year, but the full effect of the changes and economies is not yet reflected in the accounts.

NOTES AND NEWS

Institute of Transport Award.—The Institute of Transport Railway Operating Medal for 1933-34 has been awarded to Mr. C. M. Jenkin Jones, Superintendent, North Eastern Area, London and North Eastern Railway.

Canadian Pacific Earnings.—Gross earnings of the Canadian Pacific Railway for the month of October, 1934, amounted to \$12,752,000, an increase of \$767,000 compared with October, 1933, and working expenses were \$8,651,000, an increase of \$725,000, leaving net earnings \$42,000 higher, at \$4,101,000. Aggregate gross earnings for the ten months January 1 to October 31, 1934, amounted to \$103,652,000, an increase of \$9,685,000 on the corresponding period of 1933, and the aggregate net earnings of \$17,771,000 showed an improvement of \$3,741,000.

Canadian National Earnings.—For the month of October, 1934, gross earnings of the Canadian National Railway amounted to \$15,803,292, an increase of \$1,140,978 in comparison with October, 1933. Operating expenses (\$12,993,863) at the same time advanced by \$874,135, leaving net earnings \$266,843 higher, at \$2,809,429. Aggregate gross earnings from January 1 to October 31, 1934, were \$137,766,001, an improvement of \$14,887,407 on the first 10 months of 1933, and there were net earnings of \$9,951,933 contrasting with \$3,449,958 for the first 10 months of 1933.

"The Journal of the Institute of Transport."—The November issue of this journal exhibits a change in appearance, owing to the use of Gill sans type for the title and headings. The graceful and modern appearance of this face has earned it much public approval since it became widely familiar as a result of its adoption by the L.N.E.R., and the innovation in the pages of *The Journal of the Institute of Transport* will be a popular one. The inaugural address of Mr. Sidney E. Garcke on "The Study of Passenger Transport," and Mr. W. V. Wood's paper on "Transport Statistics—Their Uses and Abuses," both summarised in THE RAILWAY GAZETTE of October 12, appear in full in this number.

Whisky Spirited from Trains.—The disappearance of whisky during transit on the L.M.S.R. and L.N.E.R. is attributed by the *Daily Mail* to the activities of gangs of bandits, who grease the rails and so bring the trains to a standstill. Since a crew of three can hardly exercise its vigilance over the whole of a train, which may be 100 wagons in length, the thieves are said to have been carrying out their raids unobserved for some time past, the crates being thrown out of the wagons to confederates at the lineside, and removed by motor lorry. Most of the thefts have taken place north of

the border, and railway detectives have left London for Glasgow to investigate. Greasing the track is an old trick in India, and probably in other countries, to cause the locomotive of a heavily laden goods train to slip on a gradient, or on starting from a signal stop, so that the perpetrators may have time to carry out a raid under cover of darkness.

Buenos Ayres Central Railway.—Meetings of the holders of the 6½ per cent. ten-year secured notes and of the 5 per cent. 2nd mortgage debentures of the Buenos Ayres Central Railway held on November 27 approved a supplemental scheme of arrangement. This provides for cancellation of the arrears of interest on the notes and on the second debentures, as well as the interest on interest which was provided by the scheme passed in August, 1932 and further interest up to May 10, 1936.

Exhibition Trains in India for British Traders.—H.M. Senior Trade Commissioner in India has informed the Department of Overseas Trade that special exhibition or bazaar trains of the State Railways are now to be thrown open to manufacturers or exporters in the United Kingdom for the display of their goods. Previously, these facilities have been limited to Indian industries. Retail sales will be allowed and the itinerary will probably include Bombay, Agra, Delhi, Amritsar, Lahore, Karachi, Lucknow, Cawnpore, Calcutta, Madras and Bombay—nearly 6,000 miles in all being covered—but the details of it are variable as required. Seven broad gauge bogies will be allotted to 14 trades for exhibition purposes and a first-class bogie will accommodate the staff. The tour would take about 38 days in all. Further information is obtainable at the Indian State Railways, Publicity Bureau, 57, Haymarket, London, S.W.1.

Great Eastern Mechanics' Institution, L.N.E.R.—The annual distribution of prizes was held on Wednesday last at the Town Hall, Stratford, and was presided over by the Mayor of West Ham and Mr. William Whitelaw, Chairman of the L.N.E.R. and President of the Institution. The prize list for the session contained, in addition to the certificates awarded for successes at the examinations, donations from the directors and officers of the L.N.E.R., which were supplemented by a grant from the funds of the institution, the bulk of the total amount being apportioned to the students of the Science and Technological classes and the remainder to the Locomotive and Physical Culture classes. The number of students increased over the previous session and at the Science and Technical examinations, 59.92 per cent. passed. At the competitive examinations, held in September, in connection with the L.N.E.R. Full-Time Scholarships for assisting

apprentices to take courses of study at university engineering colleges without loss of pay, one student, R. T. Carr, was successful; this success makes a total of nine scholarships awarded to students of the Stratford Mechanics' Institution since its foundation in 1928. Until the arrival of the chairmen, a highly appreciated organ recital was given by Mr. Percy West Taylor, F.R.C.O., L.R.A.M., and the evening closed with an entertainment by Murray Ashford's Concert Party.

Advertising of To-day and To-morrow.—The Regent Exhibition of 1934, being held at the Dorland Hall, Lower Regent Street, London, from December 12 to 22, is designed to be of interest to everybody in the advertising, selling, commercial printing, and newspaper worlds, and to all others who interpret public opinion. An extraordinary feature of the exhibition is an almost entire absence of examples of railway publicity. The visitor may, in fact, find the exhibition a little distressing, as a large section is devoted to posters, mostly political, which, with the exception of those from the U.S.S.R., seem to stress the miseries of this world.

Southern Railway Assessment.—The Railway and Canal Commission has been engaged this week in hearing appeals from a decision of the Railway Assessment Authority which had in May last fixed the "cumulo" of the railway hereditaments of the Southern Railway for rating purposes for the period 1931-1935 at £2,180,000. This represented £328,000 over the present net annual value. The Southern Railway Company is appealing on the ground that the assessment should not exceed £500,000. It is contended by the London County Council, the County Valuation Committee of Middlesex, the Corporation of Croydon, and the Corporation of Brighton, on the other hand, that the figure should be £3,000,000.

The Wormley Level Crossing Accident.—The Ministry of Transport inquiry, conducted by Colonel Trench, into this fatal derailment of November 27, was resumed on Wednesday, but, as the guard was still unable to give evidence, it was further adjourned until a date to be fixed later by the inspecting officer. The driver of the motor vehicle was, however, present, and said that he opened the gates of the crossing and his vehicle had passed over the down line and was on the up road when he saw the train approaching. He added that, not being a railwayman, he was not sure that he understood what the signals meant. A representative of the passengers travelling in the train expressed concern as to their own safety and wished the inspecting officer to convey that intimation to the Minister of Transport. Colonel Trench replied that the question of occupation crossings was a most difficult one and one which was causing considerable anxiety to the Ministry

and the railway companies. Mr. F. C. Scott, of the legal department of the L.N.E.R., said that his company was extremely perturbed and the matter was being considered by the Chairman, directors and officers. The coroner's inquest was resumed and concluded on Monday last, when a verdict of "accidental death" was returned, with a recommendation that something be done to guard against a recurrence of the accident.

Intermediate Block Signalling.

The subject of the provision of intermediate block signals, either as a substitute for a proposed additional signal box or to displace an existing box, was discussed on a paper by Mr. S. W. Spendlove, at the Institution of Railway Signal Engineers on Wednesday evening. With one exception no specific installations were mentioned. The exception was the division of the block section, 2m. 4ch. in length, on a gradient of 1 in 37 rising the whole way, on the up line of the Lickey Incline. Not only was that work mentioned but, again an

exception, it was said that it had resulted in an increased traffic capacity for passenger and freight trains of 40 per cent. during the 24 hours and had reduced the delays by 57 per cent. Among those who took part in the discussion were Messrs. A. F. Bound, A. Moss, W. Lang, C. Carslake, S. Williams, B. F. Wagenrieder, S. L. Glenn, H. H. Dyer, and G. H. Crook.

The Week's Road Accidents.—The Ministry of Transport return for the week ended December 8 of persons killed or injured in road accidents is as follows:—

	Killed	Deaths resulting from previous accidents	Injured
England	105 (95)	31 (29)	3,569 (3,552)
Wales ...	4 (3)	1 (3)	146 (135)
Scotland	12 (9)	3 (1)	307 (336)
	121 (107)	35 (33)	4,022 (4,023)

The total fatalities of the week, as the result of road accidents, were therefore 156, as compared with 140 for the previous week.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 49th Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
L.M.S.R. (6,941½ mls.)	£	£	£	£	£	£
Passenger-train traffic...	394,000	385,000	+ 9,000	23,200,000	22,812,000	+ 388,000
Merchandise, &c. ...	471,000	466,000	+ 5,000	21,925,000	20,588,000	+ 1,337,000
Coal and coke ...	289,000	305,000	- 16,000	11,160,000	10,740,000	+ 420,000
Goods-train traffic ...	760,000	771,000	- 11,000	33,085,000	31,328,000	+ 1,757,000
Total receipts ...	1,154,000	1,156,000	- 2,000	56,285,000	54,140,000	+ 2,145,000
L.N.E.R. (6,339 mls.)	£	£	£	£	£	£
Passenger-train traffic...	270,000	264,000	+ 6,000	15,048,000	14,802,000	+ 246,000
Merchandise, &c. ...	339,000	331,000	+ 8,000	15,530,000	14,531,000	+ 999,000
Coal and coke ...	260,000	273,000	- 13,000	11,165,000	10,362,000	+ 803,000
Goods-train traffic ...	599,000	604,000	- 5,000	26,695,000	24,893,000	+ 1,802,000
Total receipts ...	869,000	868,000	+ 1,000	41,743,000	39,695,000	+ 2,048,000
G.W.R. (3,750½ mls.)	£	£	£	£	£	£
Passenger-train traffic...	170,000	168,000	+ 2,000	9,855,000	9,830,000	+ 25,000
Merchandise, &c. ...	185,000	178,000	+ 7,000	8,825,000	8,322,000	+ 503,000
Coal and coke ...	109,000	116,000	- 7,000	4,854,000	4,784,000	+ 70,000
Goods-train traffic ...	294,000	294,000	—	13,679,000	13,106,000	+ 573,000
Total receipts ...	464,000	462,000	+ 2,000	23,534,000	22,936,000	+ 598,000
S.R. (2,172 mls.)	£	£	£	£	£	£
Passenger-train traffic...	234,000	231,000	+ 3,000	14,219,000	13,989,000	+ 230,000
Merchandise, &c. ...	57,000	61,000	- 4,000	3,124,500	3,013,500	+ 111,000
Coal and coke ...	28,000	32,000	- 4,000	1,511,500	1,442,500	+ 69,000
Goods-train traffic ...	85,000	93,000	- 8,000	4,636,000	4,456,000	+ 180,000
Total receipts ...	319,000	324,000	- 5,000	18,855,000	18,445,000	+ 410,000
Liverpool Overhead ...	1,095	1,097	- 2	55,671	55,442	+ 229
(6½ mls.)						
Mersey (4½ mls.) ...	4,250	4,484	- 234	199,034	195,624	+ 3,410
*London Passenger Transport Board ...	539,200	513,200	+ 26,000	12,217,200	12,008,700	+ 208,500
IRELAND						
Belfast & C.D. pass.	1,618	1,561	+ 57	121,602	122,889	- 1,287
80 mls.)						
" " goods	496	452	+ 44	25,471	25,579	- 108
" " total	2,114	2,013	+ 101	147,073	148,468	- 1,395
Great Northern pass.	8,150	7,350	+ 800	483,050	379,350	+ 103,700
(562 mls.)						
" " goods	7,100	6,800	+ 300	421,250	347,700	+ 73,550
" " total	15,250	14,150	+ 1,100	904,300	727,050	+ 177,250
Great Southern pass.	22,073	19,882	+ 2,191	1,166,688	1,147,827	+ 18,861
(2,158 mls.)						
" " goods	43,238	37,155	+ 6,083	1,639,853	1,541,848	+ 98,005
" " total	65,311	57,037	+ 8,274	2,806,541	2,689,675	+ 116,866

* 23rd week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes

British and Irish Railways Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices	
			Dec. 12, 1934	Rise/Fall
G.W.R.				
Cons. Ord. ...	551½	31	51	-1½
5% Con. Prefce. ...	109¾	69½	115½	—
5% Red. Pref. (1950) ...	109¼	87½	112½	+1
4% Deb. ...	108½	99¼	116	—
4½% Deb. ...	108	100½	117½	—
4½% Deb. ...	116	106	127½	+1
5% Deb. ...	128	117½	133½	—
2½% Deb. ...	65	60	73½	+1
5% Rt. Charge ...	124	111½	133½	+1
5% Cons. Guar. ...	122	103	130½	—
L.M.S.R.				
Ord. ...	297½	12½	21	-1
4% Prefce. (1923) ...	51	17	49½	-1
4% Prefce. ...	72	33¼	85½	-1½
5% Red. Pref. (1955) ...	93	47¼	104*	—
4% Deb. ...	103¼	84½	108*	-1½
5% Red. Deb. (1952) ...	114	105	117½	+1
4% Guar. ...	97¼	68½	104½	-1½
L.N.E.R.				
5% Pref. Ord. ...	22½	7½	15	-5½
Def. Ord. ...	105¼	4½	78	-18
4% First Prefce. ...	65½	19½	70½	+1½
4% Second Prefce. ...	40½	12¼	31	-1
5% Red. Pref. (1955) ...	83½	27	89½	—
4% First Guar. ...	94½	58¼	101	—
4% Second Guar. ...	89¼	48	95	—
3% Deb. ...	77	60¼	84*	—
4% Deb. ...	102½	80	107½*	-1½
5% Red. Deb. (1947) ...	112	102½	116	—
4½% Sinking Fund Red. Deb.	107½	98½	109½*	—
SOUTHERN				
Pref. Ord. ...	71	27½	79	—
Def. Ord. ...	24½	98	23	-1½
5% Prefce. ...	107½	74	116	—
5% Red. Pref. (1964) ...	107½	78½	114½	—
5% Guar. Prefce. ...	124¼	102½	131½	—
5% Red. Guar. Pref. (1957) ...	115½	103½	118	—
4% Deb. ...	107½	96½	113½*	—
5% Deb. ...	126½	114¼	132½*	+1
4% Red. Deb. ...	107¼	100	112*	+1½
1962-67				
BELFAST & C.D.				
Ord. ...	6	4	5	—
FORTH BRIDGE				
4% Deb. ...	99½	95½	111½	—
4% Guar. ...	98½	94	110½	—
G. NORTHERN (IRELAND)				
Ord. ...	7½	3½	6	-1
G. SOUTHERN (IRELAND)				
Ord. ...	28	16	15	-11½
Prefce. ...	24	12½	16	+11½
Guar. ...	42	16¾	46	+3
Deb. ...	60	30½	66½	+5½
L.P.T.B.				
4½% "A" ...	117½	112	123½*	—
5% "A" ...	127¼	119¼	132½*	—
4½% "T.F.A." ...	111¼	106	111½*	—
5% "B" ...	122½	114	127½*	—
5% "C" ...	86¾	74½	95	+2
MERSEY				
Ord. ...	16¼	5	10	+1
4% Perp. Deb. ...	83	63½	94	+11½
3% Perp. Deb. ...	62	51	68½	+1
3% Perp. Prefce. ...	50½	27	48½	—

* ex dividend

CONTRACTS AND TENDERS

Darlington Railway Plant & Foundry Co. Ltd. has received an order from the Peruvian Corporation for 15 crossings and 15 sets of switches.

New Metadyne-Controlled Train for L.P.T.B.

The Metropolitan-Vickers Electrical Co. Ltd. has received an order from the London Passenger Transport Board to equip a six-car electric train with the metadyne system of control and regenerative braking. This principle of control has already been tried on a two-car set of the L.P.T.B., and the equipment for this unit was also built by Metropolitan-Vickers. This system of control and braking is referred to in our *Electric Railway Traction Supplement* this week.

Beynons has been awarded a contract by the Egyptian State Railways for the supply of 121,000 metric tons of coal.

The Consolidated Pneumatic Tool Co. Ltd. has received an order from the Egyptian State Railways Administration for jacks to a total value of £209 5s., delivered f.o.b. New York.

The General Electric Co. Ltd., Fraser & Chalmers Works, has received a contract from the Chinese National Railways for an electric power station and a complete coal and merchandise handling plant for installation at Lian Yuen.

S.A. du Nord de Liège, through Bolling & Lowe (Overseas) Limited, has received an order for 22 sets of switches for 75 lb. B.S. old type rails and a quantity of spare parts from the Peruvian Corporation.

Alfred Wiseman & Co. (1933) Ltd. has received an order from the Indian Stores Department for 40 spur wheels for motor bogies of electrified suburban stock, at a total price of £900 f.o.b. English port.

The Chinese Government Purchasing Commission, on behalf of the Ministry of Railways, China, has ordered railway materials and equipment for the Canton-Hankow Railway as follows:

Motherwell Bridge & Engineering Co. Ltd.: Two 10-metre, four 12-metre, five 15-metre, 35 18-metre and four 30-metre steel spans for bridges.

Patent Shaft & Axletree Co. Ltd.: Two 45-metre and four 60-metre steel spans for bridges.

P. & W. MacLellan Limited: Axes, track tools, shovels, ballast forks, spirit levels, hand saws and blades, rail sawing machine, edge tools and car replacers.

T. E. Bladon & Co. Ltd.: Lamps.

R. Gibbins & Co. Ltd.: Rail benders and tie tongs.

S. Maw Son & Sons Limited: First aid boxes.

Enoch Jones & Sons Limited: Padlocks and chains.

A. Gallenkamp & Co.: Track thermometers.

The Lamp Manufacturing & Railway Supplies Limited: Jacks.

Arthur Balfour & Co. Ltd.: Rail saw blades.

Easterbrook Allcard & Co. Ltd.: Rail drills and bits.

J. W. Carr & Co. Ltd.: Push cars and hand trolleys.

T. F. Johnson Limited: Oilcans.

R. Burley & Son Limited: Tool handles.

Bitulac Limited: Black bituminous paint.

J. L. Seaton & Co. Ltd.: Linseed oil.

J. Arnott & Son Limited: Turpentine.

J. M. Hamilton & Co. Ltd.: Red oxide paint.

Hamilton & Co. Ltd.: Paint brushes.

J. N. Mills & Co.: Wire brushes.

Turner's Asbestos Cement Co. Ltd.: Asbestos roofing sheets.

Broom & Wade Limited: Air compressor spares.

Samuel Osborn & Co. Ltd.: Cold chisels.

Large Indian Orders for Rolling Stock

A programme for purchasing 4,250 general service wagons and coaches for the Indian railways has, it is understood, been sanctioned by the Railway Standing Finance Committee, states Reuters. This will probably mean important orders for Great Britain next year, though part of the equipment will undoubtedly be manufactured in India. The cost of the wagons will amount to about £1,350,000. Owing to decreased traffic in the past few years, a large number of wagons have been scrapped without replacement and many more are due for renewal. Altogether the Railway Standing Finance Committee has sanctioned an expenditure of approximately £11,000,000 for new rolling stock, new construction, open line works and other capital expenditure, including purchase by the State of the Amritsar-Patti-Kasur Railway for £330,000.

Indian Orders for Machine Tools

The East Indian Railway has placed orders for machine tools as follows:—

The Associated British Machine Tool Makers Limited: One No. 3 Crows patent bar straightening, reeling and polishing machine, complete with electric motor (Rs. 6,366); One Clifton & Baird's No. OHC 8 heavy duty, high speed cold sawing machine, front cutting type with electrical equipment and spares (Rs. 5,015); One Butterworth's patent automatic screw machine with self-contained motor drive complete with special tool equipment (Rs. 13,586); One Butterworth's No. 2 patent automatic chucking machine with self-contained motor drive complete with 9 in. Pratt air chuck and special tool equipment (Rs. 13,296); One Ward's No. 3 automatic chuck capstan lathe with equipment for producing copper stays, complete with special equipment (Rs. 4,395); Churchill's model PAH 10 in. by 24 in. universal grinding machine, arranged for self-contained motor drive with special equipment (Rs. 11,770).

Alfred Herbert (India) Limited: One Broadbent axlebox planing machine arranged for belt drive (Rs. 6,925); One Kitchen & Wade 4 ft. 6 in. heavy duty motorised radial drilling, boring and tapping machine, complete with electrical equipment and spares (Rs. 8,510); One Alfred Herbert ball-bearing single-spindle motor-driven sensitive drilling machine complete with electrical equipment (Rs. 1,100); One Droop & Rein model S-54 oil grooving machine arranged for belt drive complete with tailstock (Rs. 2,380).

Craven Bros. (India) Limited: One ME size Craven-Rigid semi-universal milling machine, complete with electrical equipment and additional spares (Rs. 12,870).

A. C. Bottomley & Co. Ltd.: One Swift 15 in. centres roller-bearing locomotive piston ring turning boring and parting off lathe, complete with electrical equipment and four jaw independent chuck (Rs. 13,573).

Ingersoll-Rand (India) Limited: Four Ingersoll-Rand multi-vane surface grinding and sanding machines complete with additional equipments (Rs. 1,654.8).

Jessop & Co. Ltd.: One Tesometer tensile machine, complete with two sets of chucks and special equipment (Rs. 1,638).

The Indian Stores Department has placed the following orders for galvanised iron wire in weights of from 150 lb. to 600 lb. per mile as follows:—

Dorman Long & Co. Ltd.: 1,300 miles at total price of Rs. 49,131.

Jessop & Co. Ltd.: 1,050 miles at total price of Rs. 40,544.

Wright Pinhorn & Partners: 600 miles at total price of Rs. 20,499.

The Indian Cable Co. Ltd. has received an order from the Indian Stores Department for a total of 139,242 lb. of copper wire at a total price of Rs. 55,957.

The South Indian Railway has placed the following orders for materials to be supplied to the inspection of the consulting engineers, Messrs. Robt. White &

Partners:—H. J. Skelton & Co. Ltd.: Approx. 145½ tons of steel bars and sheets; and Linley & Co. Ltd.: 10 copper tube-plates.

Yates Improved Rail Anchor Co. Ltd. has received an order from the Peruvian Corporation for 12,700 improved rail anchors for 80 lb. B.S. (Revised) rails.

Reuters Trade Service learns from Chicago that the National Railways of Mexico have placed an order with the Pullman Car & Manufacturing Corporation for 800 standard-gauge box cars, 200 narrow-gauge box cars and 200 standard-gauge all-steel gondola cars.

Leyland Motors Limited has recently received the following orders:—New Zealand Government Railways: Two Lions equipped with compression-ignition engines and hydraulic torque converters; Great Southern Railways, Ireland: Twelve Tigers; and North Western Road Car Co. Ltd.: Twelve oil-engined Tigers.

New Goods Stock for Egypt

Reference was made in this and in our overseas column in our issue for November 2, to the probable call for tenders by the Egyptian State Railways Administration for perishables vans. The inquiry has now been issued and, as stated in our previous reference, is for 66 10-ton braked perishables vans with steel underframes and composite steel and wooden bodies. Tenders are due in on February 2, 1935, at the General Management, Cairo.

Tenders are invited by the Egyptian State Railways Administration, receivable at the Superintendent of Stores' office, Cairo, by January 24, 1935, for the supply of 3 single and 1 double 60-ton truck weighbridges. Tenders are also invited, receivable at the General Management, Cairo, by January 15, 1935, for the supply of 3 locomotive boilers.

The date for receipt of tenders for axles, tyres and wheels required for the G.I.P., E.B. and E.I. Railways has been extended from December 20 to January 3, 1935.

Tenders, receivable on January 1, 1935, at Bishopsgate House, 80, Bishopsgate, London, E.C.2, are invited by the Assam-Bengal Railway for 138 pairs of wagon wheels and axles.

The Bengal-Nagpur Railway is inquiring for tenders, receivable by December 31, at Gresham House, 132, Old Broad Street, London, E.C.2, for 200 wagon wheels.

The Czechoslovak Railways Administration, states Reuters, is ordering Kr. 64,500,000 worth of rails for next year, compared with Kr. 44,000,000 this year, and also Kr. 29,000,000 worth of auxiliary material.

Greenwood & Batley Limited has been appointed to represent Biram & Co. Ltd. in the Eastern counties with offices at Felixstowe and Norwich.

OFFICIAL NOTICES

THE ASSAM-BENGAL RAILWAY CO. LTD. is prepared to receive Tenders for:

138 PAIRS WHEELS AND AXLES FOR WAGONS.

Specifications and Tender Forms may be obtained at the Offices of the Company, Bishopsgate House, 80, Bishopsgate, E.C.2. A fee of £1 1s. is charged for each Specification, which cannot, under any circumstances, be returned.

Drawings may be had at the cost of the tenderer by application to Messrs. Hodges Bennett & Co. Ltd., 78, Queen Victoria Street, E.C.4.

Tenders must be delivered at the Company's Offices not later than noon on Tuesday, the 1st January, 1935.

The Directors do not bind themselves to accept the lowest or any Tender.

By Order of the Board,

W. H. J. GORE,
Secretary.

10th December, 1934.

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive Tenders for:—

200 WAGON WHEELS.

Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after Thursday, 13th December, 1934.

A fee of 10s. will be charged for each copy of the Specification, which is *NOT* returnable.

Tenders must be submitted not later than NOON on Monday, 31st December, 1934.

The Directors do not bind themselves to accept the lowest or any Tender and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
R. GRANT,
Secretary.

Universal Directory of Railway Officials and Railway Year Book

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QUESTIONS IN PARLIAMENT

Metropolitan Line Overcrowding

Mr. Goldie on December 5 asked the Minister of Transport, whether, with a view to obviating the excessive overcrowding now prevalent during rush hours on the suburban trains of the Metropolitan Railway, he was prepared to recommend to the London Passenger Transport Board that trains proceeding to a given destination should, as in the case of omnibuses, be run in duplicate, so that accommodation may be provided for other passengers.

Mr. Hore-Belisha.—The London Passenger Transport Board informs me that it is already running during the peak period, the maximum number of trains which can be worked over the junction at Finchley Road and that in the circumstances it would be impracticable to give effect to my hon. friend's suggestion. It is expected, however, that when the proposals for improving the Metropolitan service have been put into operation any overcrowding will be eliminated.

Number of Level Crossing Accidents

Mr. Guy asked the Minister of Transport if he could state the number of accidents which had occurred at level crossings since the repeal of the speed limit at railway level crossings by the Road and Rail Act, 1933.

Mr. Hore-Belisha.—140 accidents during 1933, and 122 accidents during the first ten months of 1934, in which the employment of trains at public road level crossings has been involved, have been reported by the railways.

Accommodation Crossings

Lt.-Comdr. Tufnell on December 6 asked the Minister of Transport, whether, in view of the danger to the general public of accommodation railway crossings, he would consider taking steps to set up systems of traffic lights to be operated by the approaching train at a distance, thus ensuring due warning in bad visibility.

Mr. Hore-Belisha.—While I have no power in this matter, I have nevertheless directed that my hon. friend's suggestion should be brought to the notice of inspecting officers appointed to hold inquiries into accidents at accommodation crossings, and any recommendations on the subject which they may make in their reports will be conveyed to the proper quarter.

Mr. Temple Morris on December 10 asked the Minister of Transport if he would state the number of accommodation crossings which existed in this country; and whether, in view of the serious mishaps which occur to trains on such crossings, he would endeavour to enforce some better system of supervision and control for the public safety.

Mr. Hore-Belisha.—I cannot say how many railway accommodation crossings there are, but there can be little doubt that the number of such crossings largely exceeds the number of public road crossings, and may be 10,000 or more. During 1933, 43 train accidents, in which 13 persons (including 6 pedestrians) were killed, have been reported at railway occupation crossings, as compared with 140 train accidents, in which 8 persons (including 6 pedestrians) were killed, at public road crossings. As my hon. friend will see, the risk of accidents at occupation crossings is relatively not large, and while I have no power to enforce the provision of safeguards for the travelling public, the attention of railway companies or other parties concerned will be called to any recommendations which may be made in any official reports on accidents of this kind.

The Ministry of Transport

Mr. Alan Todd asked the Prime Minister whether he would consider the immediate appointment of a Parliamentary Secretary to the Ministry of Transport in view of the arduous nature of the Minister's present duties.

Mr. Ramsay MacDonald.—This ques-

tion is under consideration, but it is not quite clear at the moment that the need for an appointment has arisen.

East and North-East London Communications

Mr. Groves on December 12 asked the Minister of Transport whether he proposed any action to implement the undertaking given to Parliament that improvements would be effected in the travelling facilities for the East End; and when it was proposed to make arrangements for the construction of a tube railway and the electrification of the L.N.E.R. suburban lines.

Mr. Hore-Belisha.—The hon. gentleman will be aware that the matters referred to in the question are not under my control. I am, however, circulating a summary of information with which I have been furnished by the London Passenger Transport Board. The following is the summary:—I understand that powers to convert the local tramcar services in Walthamstow, Leyton, West Ham, East Ham, and Ilford to trolleybus operation, and to run trolley vehicles along Silvertown Way to Woolwich Ferry, are being sought in the London Passenger Transport Board's Bill in the present Session. I also understand that a new service of coaches from Aldgate starting at the Minories lay-by and terminating at Gidea Park, operating via Leyton, Wanstead, Cranbrook Park and Romford every 15 minutes, has been provided, and that on the trunk route, London and Brentwood, 26 more journeys a day have been provided than were operated by the Board's predecessors and that a further 17 journeys a day are now to be operated. As regards the construction of a tube railway and the electrification of the L.N.E.R. suburban lines, I am informed that these questions are receiving the consideration of the Standing Joint Committee of the London Passenger Transport Board, and the main line companies, set up under the London Passenger Transport Act, 1933, but that no decision has yet been reached.

The Share Market

The stock and share markets have reflected the improvement in the European political position. Home railway prior lien stocks have tended to harden with the gilt-edged market, but greater attention is now being paid to the dividend prospects of the preference stocks of the four grouped companies. London Midland & Scottish first preference stock is continuing to reflect the favourable impression created by the decision of the directors to pay the preference dividend on the 5 per cent. redeemable preference stock.

The respective quotations of the 4 per cent. first preference and the 5 per cent. redeemable preference stocks show a difference of about 20 points. The yield on the redeemable stock is £4 16s. per cent., and on the same basis the first preference

stock is accurately quoted at around 83, so that the difference in capital value is solely attributable to the larger dividend on the redeemable stock and not to any advantages which accrue from a fixed redemption date. Any benefits arising from the latter are apparently deemed to be counterbalanced by the wider scope for rise in capital value of the 4 per cent. stock. London & North Eastern first preference has come into the favour of investors who are seeking a larger return with prospective capital appreciation. This stock has risen now to over 70, but it is still about six points below the best price of the year. There has been a tendency to exchange from the second preference stock into the first preference stock, as the latter has a prospective yield of over 5½ per cent. Great Western ordinary was stimulated this week by the proposed Welsh colliery merger. Southern preferred and deferred stocks have again

found buyers, the dual purchase being in favour on account of the combination of yield with capital appreciation offered by the two stocks when treated as one. London Passenger Transport Board "C" stock has made further headway on dividend prospects.

In foreign railways Argentine issues had a relapse. Cordoba Central first debenture stock has again been purchased speculatively, although there is no indication in actual fact of the "conversations" with the Argentine Government regarding possible acquisition of the line having made any definite progress. The market is hoping that the departure of a director to Argentina may be significant of some early development. Among other stocks there is evidence that buyers are prepared to take risks in order to get a high interest return, and this accounts for the upward movement in such stocks as Manila debentures.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1933-34	Week Ending	Traffics for Week		No. of Week	Aggregate Traffics to Date			Shares or Stock	Prices					
			Total this year	Inc. or Dec. compared with 1933		Totals		Increase or Decrease		Highest 1933	Lowest 1933	Dec. 12, 1934	Yield % (See Note)		
						This Year	Last Year								
			£	£		£	£	£							
Antofagasta (Chili) & Bolivia	830	9.12.34	17,430	+	7,540	49	730,480	534,160	+	196,320	Ord. Stk.	26	11½	23	Nil
Argentine North Eastern	753	8.12.34	6,363	—	479	23	172,456	214,348	—	41,892		14½	5	9	Nil
Argentine Transandine	111										A. Deb.	55	40	50½	8
Bolivar	174	Nov., 1934	5,750	+	450	47	65,700	67,350	—	1,650	6 p.c. Db.	10	5	10	Nil
Brazil											Bonds.	15	11	13	31½
Buenos Ayres & Pacific	2,806	8.12.34	70,526	—	3,921	23	1,580,566	1,878,208	—	297,642	Ord. Stk.	26	97½	92	Nil
Buenos Ayres Central	190	18.11.34	\$97,200	—	\$22,000	20	\$2,528,000	\$2,375,000	+	\$153,000	Mt. Db.	30	10	23	Nil
Buenos Ayres G. Southern	5,085	8.12.34	116,982	—	25,409	23	2,761,652	3,542,028	—	780,376	Ord. Stk.	44½	21½	23½	Nil
Buenos Ayres Western	1,930	8.12.34	44,444	—	4,711	23	948,138	1,223,724	—	275,586	"	34½	15½	21½	Nil
Central Argentine	3,700	8.12.34	102,447	—	24,113	23	2,663,674	3,136,568	—	472,894	"	28½	15	14½	Nil
Do.											Prd.	18	10	8	Nil
Cent. Uruguay of M. Video	273	8.12.34	20,020	+	4,549	23	369,670	368,112	+	1,558	Ord. Stk.	20	8	9½	Nil
Do. Eastern Extn.	311	8.12.34	3,901	+	608	23	75,106	69,904	+	5,202					
Do. Northern Extn.	185	8.12.34	2,064	—	320	23	40,542	39,621	+	921					
Do. Western Extn.	211	8.12.34	1,314	+	25	23	32,994	32,342	+	652					
Cordoba Central	1,218	8.12.34	29,470	—	1,090	23	694,900	911,940	—	217,040	Ord. Inc.	9¼	2½	4½	Nil
Costa Rica	188	Oct., 1934	13,646	—	2,769	13	63,485	81,190	—	17,705	Stk.	29	20	30	57½
Dorada	70	Oct., 1934	11,700	+	3,500	43	102,400	78,400	—	24,000	1 Mt. Db.	76½	68½	102½	57½
Entre Rios	810	8.12.34	12,660	+	443	23	266,492	301,145	—	34,653	Ord. Stk.	26½	9	13	Nil
Great Western of Brazil	1,082	8.12.34	15,300	+	2,400	49	438,100	497,206	—	59,100	Ord. Sh.	23½	12	5½	Nil
International of Cl. Amer.	794	Oct., 1934	\$306,149	+	\$28,040	43	\$3,946,054	\$3,778,077	+	\$167,977					
Intercontinental of Mexico											1st Pref.	12	1½	1½	Nil
La Guana & Caracas	223½	Nov., 1934	3,085	+	585	47	39,150	52,270	—	13,120	Stk.	16	10	8½	Nil
Leopoldina	1,918	8.12.34	20,178	—	1,540	49	1,245,310	1,204,093	+	41,217	Ord. Stk.	20½	10	8½	Nil
Mexican	483	7.12.34	\$231,800	+	\$29,400	22	\$5,111,700	\$4,271,500	+	\$840,200		3	12	2	Nil
Midland of Uruguay	319	Nov., 1934	13,536	+	2,364	21	52,325	45,688	+	6,637		2	1	1½	Nil
Nitrate	401	30.11.34	10,662	+	1,402	47	230,367	127,235	+	103,132	Ord. Sh.	78½	11½	27½	Nil
Paraguay Central	274	8.12.34	5,520	+	2,150	23	104,900	76,130	+	28,770	Pr. Li. Stk.	72	49½	81½	7½
Peruvian Corporation	1,059	Nov., 1934	58,693	+	621	21	309,538	274,940	+	34,598	Prd.	15¼	5	9	Nil
Salvador	100	1.12.34	£18,500	+	£4,146	22	£227,677	£306,920	—	£79,243	Pr. Li. Db.	70	66½	70	7½
San Paulo	1,531½	2.12.34	33,825	—	3,142	48	1,426,937	1,445,404	—	18,467	Ord. Stk.	102	68	71	5½
Taltal	164	Nov., 1934	2,225	+	420	21	11,430	8,892	+	2,538	Ord. Sh.	13¼	5½	11½	5½
United of Havana	1,365	8.12.34	13,503	—	1,748	23	375,641	297,327	+	78,314	Ord. Stk.	8	2	3	Nil
Uruguay Northern	73	Nov., 1934	1,322	—	332	21	5,766	6,085	—	319	Deb. Stk.	6	3½	5½	Nil
Canadian National	23,733	7.12.34	600,589	+	817	48	30,910,193	27,833,021	+	3,077,172					
Canadian Northern											Perp. Dbs.	60½	38	77½	53½
Grand Trunk											4 p.c. Gar.	99½	85	103½	37½
Canadian Pacific	17,018	7.12.34	522,200	+	39,800	48	23,489,600	21,353,800	+	2,135,800	Ord. Stk.	22½	11	12	Nil
Assam Bengal	1,329	10.11.34	28,192	+	702	32	859,800	743,591	+	116,209	Ord. Stk.	79	70	87½	37½
Barsi Light	202	17.11.34	4,627½	+	1,822	33	90,082	97,230	—	7,148	Ord. Sh.	101½	70	102½	57½
Bengal & North Western	2,112	17.11.34	43,885	—	5,011	7	281,979	304,336	—	22,357	Ord. Stk.	292	240	293½	57½
Bengal Doonars & Extension	161	17.11.34	3,189	—	669	33	98,344	97,962	+	382	"	127	119	125½	59½
Bengal-Nagpur	3,269	10.11.34	93,450	—	14,101	32	3,492,080	3,232,820	+	259,270	"	97½	83½	103½	37½
Bombay, Baroda & Cl. India	3,072	1.12.34	169,500	—	14,850	35	5,215,500	4,982,700	+	232,800	"	112	107	112½	55½
Madras & South'n Mahratta	3,230	17.11.34	82,350	—	13,582	33	3,576,042	3,541,502	+	34,540	"	127	114½	125½	79½
Rohilkund & Kumaon	572	17.11.34	8,378	+	690	7	53,056	50,225	+	2,831	"	260	225	264	51½
South India	2,526	10.11.34	62,413	—	12,387	32	2,580,026	2,521,275	+	58,751	"	119½	112	117½	61½
Beira-Umtali	204	Sept., 1934	63,487	+	15,845	52	651,264	502,517	+	148,747					
Bilbao River & Cantabrian	15	Nov., 1934	1,614*	—	969	48	18,333	17,992	+	341					
Egyptian Delta	621	20.11.34	8,234	—	1,611	33	149,246	140,477	+	8,769	Prf. Sh.	131½	13½	2½	4
Great Southern of Spain	104	1.12.34	2,485	—	689	48	108,027	107,671	—	356	Inc. Deb.	4	3	3½	Nil
Kenya & Uganda	1,625	Mar., 1934	240,520	+	21,064	12	638,137	606,192	+	31,945					
Manila											B. Deb.	53	33½	49	7½
Mashonaland	913	Sept., 1934	114,596	+	26,892	52	1,191,218	819,297	+	371,921	1 Mg. Db.	91½	42	100½	2
Midland of W. Australia	277	Oct., 1934	16,764	+	2,383	17	56,354	52,543	+	3,811	Inc. Deb.	89	70	97½	4½
Nigerian	1,905	20.10.34	35,610	+	6,118	29	769,899	649,412	+	120,487					
Rhodesia	1,538	Sept., 1934	183,340	+	18,488	52	1,993,827	1,505,845	+	487,982	4 p.c. Db.	98½	80½	104½	31½
South African	13,217	17.11.34	542,806	+	68,264	33	16,730,991	14,783,545	+	1,967,446					
Victorian	6,172	Aug., 1934	740,142	+	27,143	8	1,433,140	1,380,045	+	53,095					
Zafra & Huelva	112	Oct., 1934	13,759	+	438	43	116,325	112,900	+	3,425					

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1%.
 * Rebellion. † Receipts are calculated @ 1s. 6d. to the rupee. ‡ Kartiki Fair, 1934. § ex dividend. Salvador receipts are in currency.
 The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value.

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